Network

Railways of Australia Quarterly

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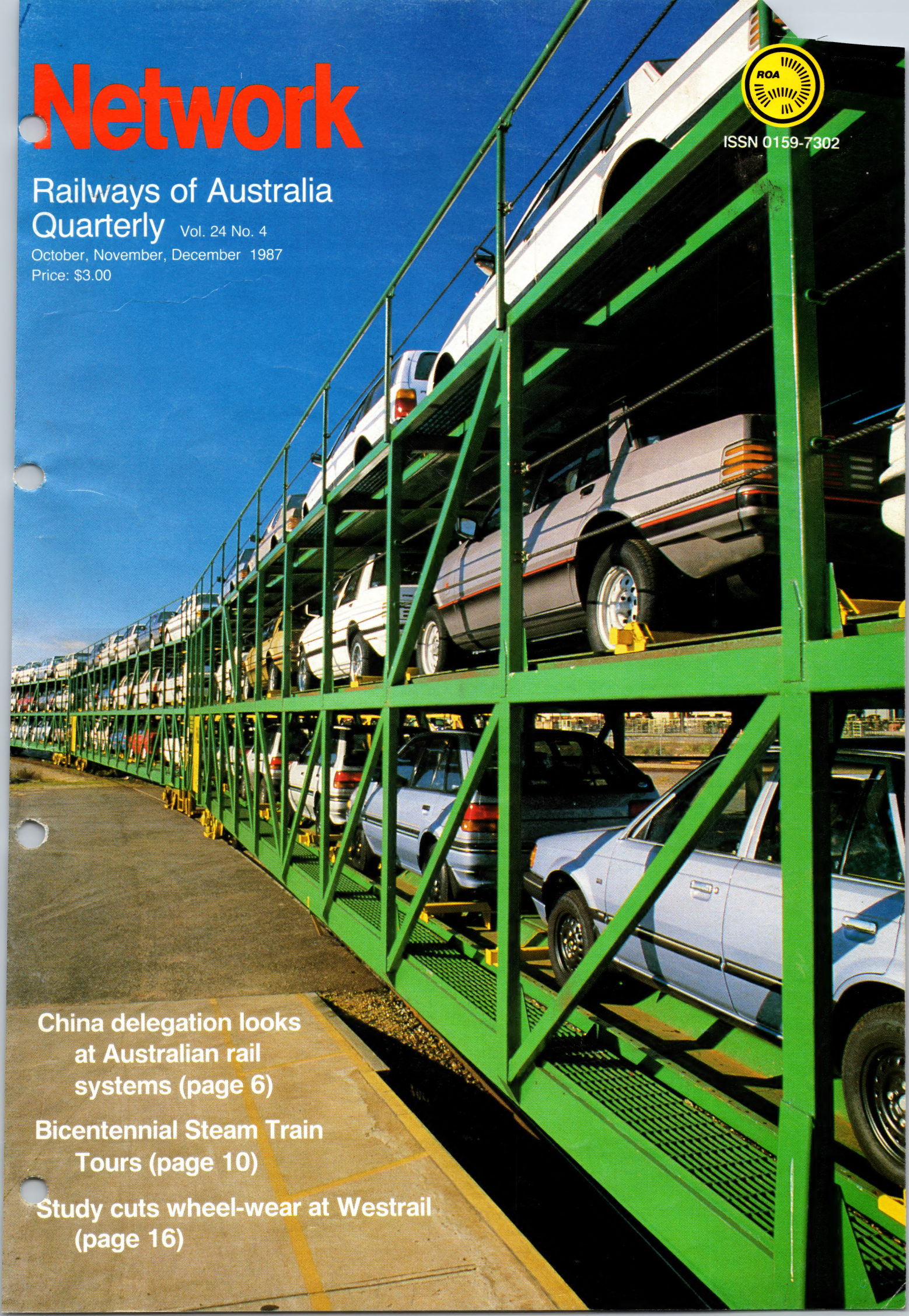

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China delegation looks at Australian rail systems (page 6)

Bicentennial Steam Train Tours (page 10)

Study cuts wheel-wear at Westrail (page 16)

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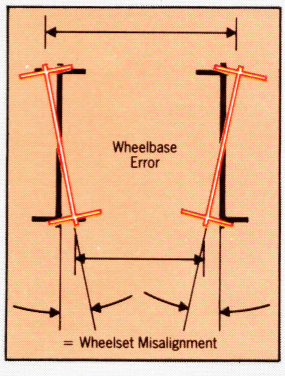

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October, November, December 1987
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- *Australian National (including Tasmania)*
- *Queensland Railways*
- *State Rail Authority of New South Wales*
- *State Transport Authority — Victoria (V/Line)*
- *Western Australian Government Railways (Westrail)*

Associate Members:

- *Metropolitan Transit Authority of Victoria*
- *State Transport Authority — South Australia*

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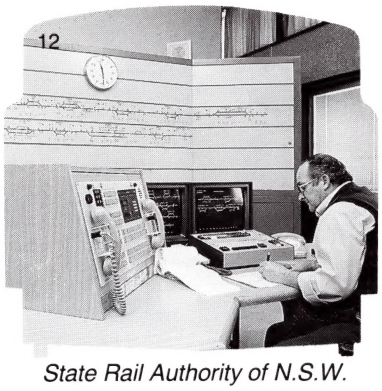

State Rail Authority of N.S.W.

Westrail

Australian National

V/Line

Contents

Front Cover:

Australian National's new tri-deck car carriers regularly leave the Islington Freight Terminal in Adelaide for Perth, W.A.

Our only requirement of writers and personalities who contribute to Network is that they be informative or entertaining and that their subject has relevance to the wide interests of railwaymen today. Naturally, there will be occasions when their viewpoints or opinions run contrary to those of the editor or to Railways of Australia. We must accept that these differences are among the elements essential to the presentation of a lively and interesting magazine.

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The *EXECUTIVE DIRECTOR'S* column

'Transport — who pays?'

"Transport — Who Pays?" was the theme of the 12th Australian Transport Research Forum, held in Brisbane last July.

For more than 12 years, the ATRF has provided an opportunity for researchers to present their findings into all aspects of Australia's transport systems.

The researchers themselves come primarily from the academic and public sectors, but there is a strong private sector participation in both paper presentation and attendance at the gathering.

The choice of theme was most appropriate at a time when all governments are looking very critically at the escalating costs of all forms of transport in this country.

Additionally, there are controversial thoughts of regulation versus deregulation in several modes — and the alternatives impinge on cost recovery.

The public purse contributes directly to all sectors of Australia's transport systems — it builds the roads, it provides the airports, it maintains safety at sea and builds port facilities, and makes up the shortfall between railway revenues and railway costs.

In his foreword to the conference papers, the chairman, Mr Neal Kent, Commissioner for Transport in Queensland, commented on the high quality of the papers presented. They were, indeed, of high standard, and many of them had direct relevance to rail's sector of Australia's transport task.

A leading paper prepared by Ms Fay Holthuysen from the Federal Department of Transport in Canberra looked at the Finances and Performances of Australia's rail systems.

The paper pointed out that in real terms, Australia's rail operating deficits have increased during the last five years.

There are, of course, variations between systems, but that is the total effect.

"Rail has not been able to take advantage of a greatly increased domestic freight task," says the paper.

Why not? The answer lies in the relativity of cost recovery between competing modes.

And the area of greatest concern to rail is its inability to compete fairly with heavy road transport vehicles, both freight and passenger.

The ***rail*** deficits are listed by Ms Holthuyzen for all to see — their totality is real, and readily apparent.

What is not readily apparent is the effect on the public purse which rail's major competitors are having on our road systems.

And this factor was brought to life clearly in other papers presented at the conference.

Mr. I. Hart, Research Economist with the Australian Automobile Association in Canberra, highlighted the results of the National Road Freight Industry Inquiry.

One of its conclusions was that ***the heavy transport sector does not make a fair contribution*** to the cost of the road network, and is responsible for a high proportion of the costs of maintaining it.

His paper noted disputes with the recommendations of the Review of Road Vehicle Limits (suggesting heavier, longer vehicles) — the disputants arguing that the methods used were inadequate measures of road damage compared with other options.

A table included in the paper shows that the current road damage cost for a six-axle articulated road vehicle is approximately $27,500 per annum, and in consequence "it would appear that an interstate registration charge of $600 is grossly inadequate."

We agree.

Another paper by Messrs Luck and Martin from the Federal Bureau of Transport Economics in Canberra confirmed this view.

They agree that the revenue paid by operators of heavy vehicles falls well short of their fully-allocated costs, and even their share of avoidable costs — costs required over the life cycle of a road in terms of maintenance, resealing, and restoration, required to repair damage.

Speaking to the paper, Mr Martin mentioned that charges in the order of $35,000 were being levied on heavy vehicles overseas.

These are the levels of charges which our governments would need to impose to even up competition with rail.

Martin gave us his option that we need to solve the problem of road pricing first — before the question of railway deficits could be tackled.

And this is the nub of the matter. Rail is doing its best to contain deficits by attacks on costs. But the other side of the equation — rail's revenues — must reflect market charges.

And if one competitor is provided semi-gratis with right-of-way at a cost far lower than rail's, or than its true cost, then their prices will be correspondingly lower.

Fair levies on road users will force prices to a more correct level, and rail's charges can rise in turn.

The taxpayer's contribution to Australia's total transport services will be reduced.

From the opening remarks of the Keynote Speaker to the conclusions of an expert panel of four, the theme of equitable cost recovery was paramount in the ATRF.

I commend the papers to you and, in the interests of your own pocket and the nation's well-being, I suggest that you take their message to heart.

M. C. G. SCHRADER
EXECUTIVE DIRECTOR

M. C. G. Schrader

courtesy

China delegates

At the invitation of **Mr R.T. Sheehy,** Chairman of the Railways of Australia Committee, a Railway Technical Delegation of the People's Republic of China, led by **Mr Tu Yourui,** Chief Engineer of the Ministry of Railways, visited Australia from 16 to 30 May, 1987.

The delegation included: **Mr He Bi** — Deputy Director, Department of Science and Technology; **Mr Ding Qie** — Chief Engineer, Locomotive Bureau; **Mr You Jinfa** — Chief Engineer, Permanent Way Bureau; **Mr Fu Zongliang** — Chief Engineer, Beijing Railway Administration; **Mr Mao Weinuo** — Division Chief, Foreign Affairs Bureau; **Mr Jiang Minmin** — Associated Research Fellow, Academy of Railway Sciences; **Mr Zhao Yuehai** — Official Interpreter, Foreign Affairs Bureau.

The delegation arrived in Sydney on Saturday, 16 May, and after being welcomed by State Rail Officers and a short coach tour of Sydney, departed by air for Perth to commence their intensive inspection program.

At Perth Airport they were welcomed by Mr. Ian McCullough, Commissioner, and other senior Westrail personnel.

Upon arrival in Perth the delegates expressed a great desire to see the iron ore operations in the North West, which Westrail arranged in addition to the planned itinerary, which was modified accordingly.

On Sunday 17 May the delegates visited various hi-tech organisations prior to their visit to Dampier and Hamersley Iron Ore Railways.

On their return to Perth the party boarded Australian National's Special Conference Car which had been attached to the "Eastliner" Freight Express, arriving in Port Augusta early on Thursday, 21 May. Here inspections were made of workshops, sleeper manufacturing facilities and coal loading and unloading by rotary tippler.

The inspections continued at Whyalla and included the BHP rail rolling mill.

The following day saw the group in Adelaide where the itinerary included Australian National's intermodal freight operations, the bogie exchange and the grain terminal facilities. The party then left Adelaide on "The Overland" for Melbourne.

The V/Line arrangements included inspection of the grain loop at North Geelong by special train (itself a rare occurrence), a visit to the South Dynon locomotive depot and to the Metrol facility.

The delegation then boarded the "Sydney Express" for the overnight trip to Sydney and the hospitality of the State Rail Authority of New South Wales.

In their three days in New South Wales the party visited many State Rail operations and installations:

- Prince Alfred sidings electrical control room;
- XPT depot, Sydenham;
- Flemington servicing depot;
- Homebush signalling control room;
- Clyde and Comeng Manufacturing Plants at Granville;
- Passenger facilities at Central station.

At a meeting with State Rail executives there was an interchange of the ideas and principles involved in the administration and operation of railways, with personnel of both groups making positive contributions to the successful discussions.

Chief Executive, Pat Johnson, explained to the delegation State Rail's organization and objectives, with other SRA executives covering subjects such as timetabling, Metropolitan scheduling, seat reservation systems, locomotives and other rollingstock, major freight tasks and passenger services.

The delegation was impressed by State Rail's XPTs, and travelled by XPT to Broadmeadow where they inspected the new Centralised Traffic Control (CTC) centre, yards and locomotives, as well as the manufacturing plant of A. Goninan & Co.

While in the Hunter Valley the visitors inspected export coal loading operations at Mount Thorley and Port Waratah.

The delegation then boarded the "Brisbane Limited Express" at Broadmeadow for the overnight trip north to Brisbane.

On arrival in Brisbane on Wednesday 27 May the Chinese delegation was welcomed by Mr. Ralph Sheehy, Commissioner of Queensland Railways. Following discussions and briefing, the party divided, with one group visiting Tamper (Aust.) Pty. Ltd. and the other proceeding to Commonwealth Engineering to inspect the new electric locomotives being built by Comeng. The groups rejoined at the Mayne Control Centre prior to their flight to Mackay.

On Thursday, 28 May, the party proceeded to Coppabella to inspect Queensland Railways' servicing and maintenance facility on the Goonyella Railway System. Coppabella services a total of 14 heavy mineral trains, which transport 30 million tonnes of coal each year to the twin ports of Hay Point and Dalrymple Bay from the Bowen Basin coal deposits in the hinterland.

The trains are hauled by electric and diesel traction, and range up to 10,500 tonnes and 2 km in length. Up to five locomotives are used on the electric-hauled trains and up to six on the diesel services. Electrification (25,000 volts AC) is being extended throughout the system. The Chinese visitors were able to:

- Review the servicing, fuelling and maintenance of diesel electric locomotives and wagons.
- Observe the Train Driver Training Simulator in use. This was "driven" by Mr. Ding Qie (Chief Engineer, Locomotive Bureau).
- Ride on the double headed electric locomotive to Hay Point.

Whilst at Hay Point, the on and off shore facilities were inspected together with the rotary dumper unloading of wagons. In the afternoon, at Dalrymple Bay, the unloading of a bottom discharge train was witnessed, and the on shore facilities were inspected.

The party proceeded by road to Rockhampton. At night Mr. Sheehy joined the party, and in his capacity as Chairman of Railways of Australia, he and Mr. Tu (for China) signed a "Summary of Discussions" which

'HEAVY HAUL OPERAT

returned

irvey Australian Railways

Above: three of the delegates in the cab of an N Class locomotive with senior V/Line driver, Kevin Whelan.

From the left, Mr Zhao Yuehai, Foreign Affairs Bureau; Mr Ding Qie, Chief Engineer, Locomotive Bureau; Mr He Bi, Deputy Director, Scientific Bureau; Mr Tu Yourui, Chief Engineer of the Ministry; Mr Michael Schrader, Executive Director, Railways of Australia Committee; Mr Mao Weinuo, Division chief, Foreign Affairs Bureau; Mr Jiang Minmin, Associated Research fellow of the Academy of Railway Sciences; Mr You Jinfa, Chief Engineer, Permanent way Bureau.

recorded the outcome of the Chinese Mission to Australia. The summary noted the proposal of some railway systems to exchange personnel with China Railways; it proposed continuing co-operation and future exchanges such as study visits for railway specialists from one country coming to the other.

On Friday, 29 May, the inspecting party proceeded to the Blackwater area and to Curragh Mine. On the route, train operations, the Bluff depot and Yarabee loadout facility were observed, and on arrival an inspection was made of Curragh Mine, the surface workings and rail loading station.

In particular, the delegation witnessed an electric locomotive hauled train being loaded. This was of special interest as arrangements are provided to ensure that each pantograph is lowered as the electric locomotive passes under the loadout chutes. It is raised again to the contact wire on the departure side of the terminal.
Proceeding to Rockhampton, four members of the inspecting party rode on a five engine diesel electric locomotive hauled train to witness the operation of "Locotrol" equipment.
Later that day, the Chinese delegation proceeded by air to Sydney.
On Saturday, 30 May, the Chinese Ministry of Railways delegation left Sydney on a direct flight to Beijing.
In early July, Mr. Michael Schrader, Executive Director of the Railways of Australia Committee, received a formal letter from Zhao Yuehai, expressing appreciation of the visit to Australia.

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ROA signs tech-exchange pact with Amtrak

Over recent years, the Railways of Australia Committee has established a co-operative relationship with the National Railroad Passenger Corporation of USA, better known as Amtrak.

Amtrak has always been willing to discuss with the managements of Australian rail systems their problems and solutions to them.

We in turn have facilitated access by Amtrak to areas in which we have developed expertise.

These information exchanges have now been formalised with the signing of an agreement between the two bodies.

The initiative for this formality came from Amtrak, which has similar agreements with railways in other parts of the world.

The agreement provides for an exchange of information in areas of common interest including high speed rail, signalling, telecommunications, electrification, new equipment for rollingstock and tracks, train operations and maintenance engineering.

Transportation safety, research, development and testing of railway components, as well as marketing and reservations sales technology in systems is included.

These areas of mutual co-operation will be developed through exchanges of scientific and technical railway publications and access to internal technical conferences or seminars organised by either organisation.

It is not intended that large numbers of railway executives will journey between the two countries — but if business takes senior management to either country and there is an opportunity for on-the-spot discussions in a formalised sense, then such opportunities will be pursued.

Both organisations will, of course, keep the information exchanged on a confidential basis and copyright will remain with the originators of all documents.

Railways of Australia will serve as the technical co-ordinating agent between Amtrak and the members of ROA to avoid duplication of effort.

The formal agreement was executed in July by Mr Henry R. Moore, Executive Vice-President and Chief Operating Officer of Amtrak and by Mr Michael Schrader, Executive Director of the Railways of Australia Committee.

N.S.W. Premier Barrie Unsworth (right) and John Fitzgerald, chief general manager of A. Goninan and Co., pictured in front of the $300,000 full-size model of the Tangara supertrain.

Tangara targets on time

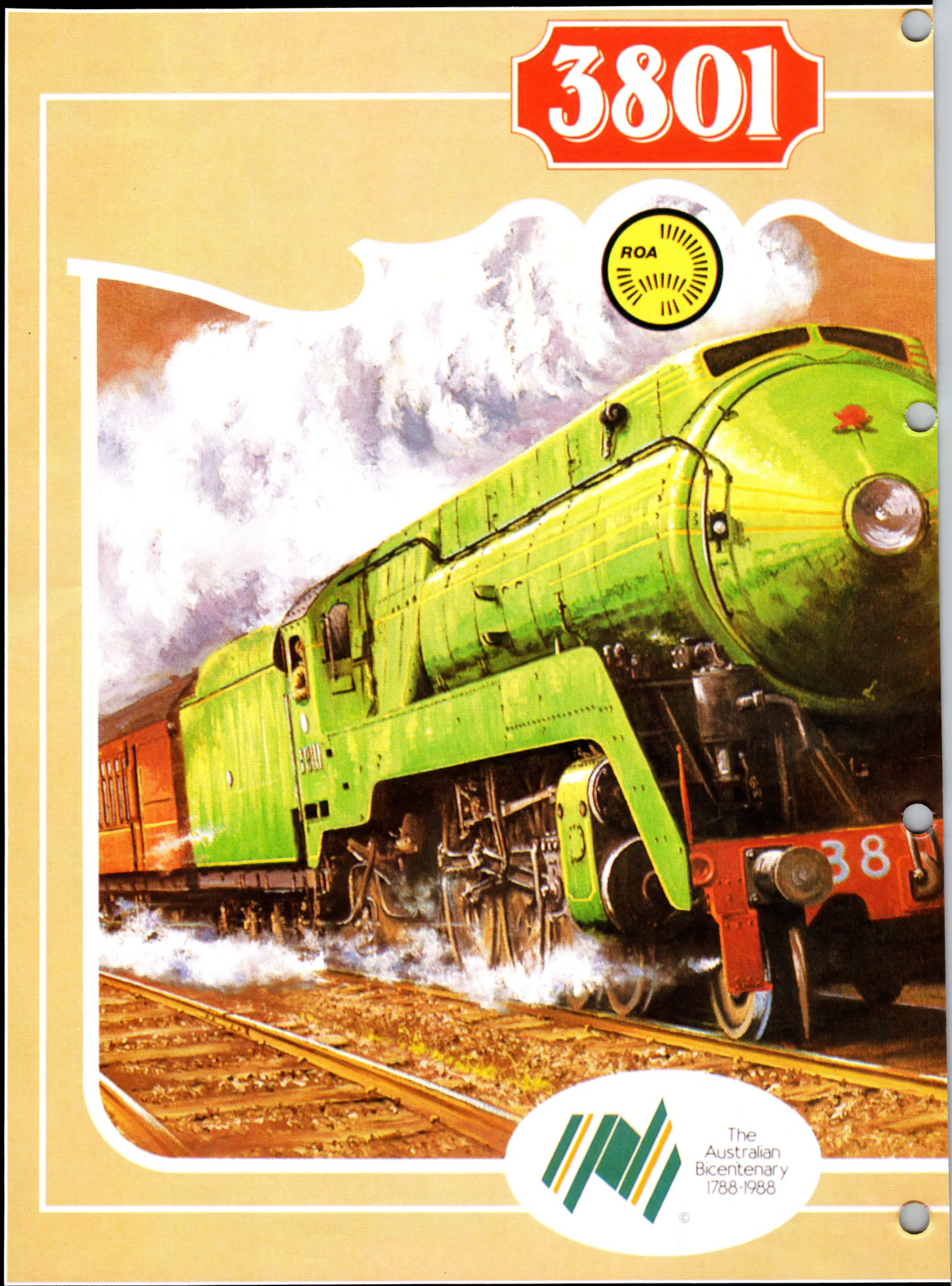
The Tangara is on schedule and the first four-car set of the 450-car, $500 million space-age suburban train project will be working on the Sydney system by the end of the year.

Staff at A. Goninan and Co., of Newcastle, major constructor of Tangara are working up to three shifts a day to get the train on the rails by their deadline.

When in full swing, the production line will be turning out 60 Tangara carriages each year.

The N.S.W. Premier, Mr Barrie Unsworth, after inspecting the mock-up Tangara carriage and production line, said Tangara "in the flesh" was even better than he had pictured.

Premier Unsworth has been particularly interested in the Tangara since September, 1985, when he first announced as Minister for Transport the trains would be built.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This famous locomotive was commissioned in 1943, and is the only steam locomotive to have crossed Australia from east to west — a feat accomplished in 1970.

Railways of Australia — an association of the five government-owned rail Systems — have agreed that 3801 will haul special trains throughout Australia in our Bicentennial Year.

Choice of Tours

There are nine special rail tours — visiting Adelaide, Brisbane, Canberra, Melbourne, Perth and Sydney.

These range from single day tours to eight days for the transcontinental crossing from Sydney to Perth.

Dates and costs are as follows:

Tour No. 1	Sydney to Canberra Date: March 13 1988 Cost: $65
Tour No. 2	Canberra to Sydney Date: March 20 1988 Cost: $65
Tour No. 3	Sydney to Perth Date: April 27-May 5 1988 Cost: $1385-1620
Tour No. 4	Perth to Adelaide Date: May 16-20 1988 Cost: $1025-1215
Tour No. 5	Adelaide to Sydney Date: May 30-June 3 1988 Cost: $590
Tour No. 6	Sydney to Brisbane Date: September 16-18 1988 Cost: $340
Tour No. 7	Brisbane to Sydney Date: October 1-3 1988 Cost: $340
Tour No. 8	Sydney to Melbourne Date: October 15-16 1988 Cost: $240
Tour No. 9	Melbourne to Sydney Date: October 29-30 1988 Cost: $240

Passenger Cars. The Bicentennial Steam Train will consist of eight compartment 64 seat sitting carriages, non air-conditioned. The standard of travel will simulate the conditions existing when the 38 Class locomotives first came into service.

Meals. Most breakfasts and dinners will be served off the train at the hotel/motel accommodation arranged as part of the tours.

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Accommodation. Accommodation will be of a good standard at the places nominated in the more detailed itinerary, and on a twin share basis. Most accommodation is within easy walking distance of the station. Single accommodation is available in some locations at an additional cost.

Tour Costs. The tour costs shown apply to ***all*** passengers. There are no concessions. All costs indicated are for one way travel.

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Some discount travel is available for early birds who arrange their Bicentennial bookings promptly. Accommodation or air travel can also be arranged. Simply note your requirements on the booking form.

Ask for the special 8 page colour brochure at any Rail Travel Centre, Interstate Booking Office or at major railway stations.

The larger brochure provides full details on tour itineraries etc. and features a booking form on the outside back cover.

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State Rail opens $24m CTC system

The SRA's $24 million Centralised Traffic Control (CTC) signalling system from Aberdeen to Werris Creek, officially opened late in July, will cut journey times by 30 minutes over the 125km section and save hundreds of thousands of dollars each year.

A plaque recording the opening was unveiled at the Broadmeadow CTC Centre by SRA Chairman, Sir Lenox Hewitt, who deputised for Acting Premier and NSW Minister for Transport, Ron Mulock.

SRA Chief Executive, Pat Johnson, was first to activate a switch to clear for Werris Creek a freight train driven by Reg Barton stopped at Aberdeen.

The changeover to CTC took 2½ years and included:

- extension of eight crossing loops to cater for 42-wagon freight trains;
- extensive automatic level crossing protection;
- automatic route setting facilities to allow for fully automatic operation of the system;
- full-track circuiting of the entire section; and
- the use of state-of-the-art fibre optics communications links.

Train signals between Aberdeen and Werris Creek are now controlled by a single operator based at Broadmeadow, 137 km from Aberdeen.

Under the old manual signalling system, a signal operator was required at every crossing loop.

The Broadmeadow CTC Centre has a lighted indicator diagram that shows the operator where every train is and a VDU screen indicates the train's number.

The Aberdeen to Werris Creek CTC is the fifth such installation in NSW; the Telarah to Casino and Wagga Wagga to Albury sections are controlled by a similar system.

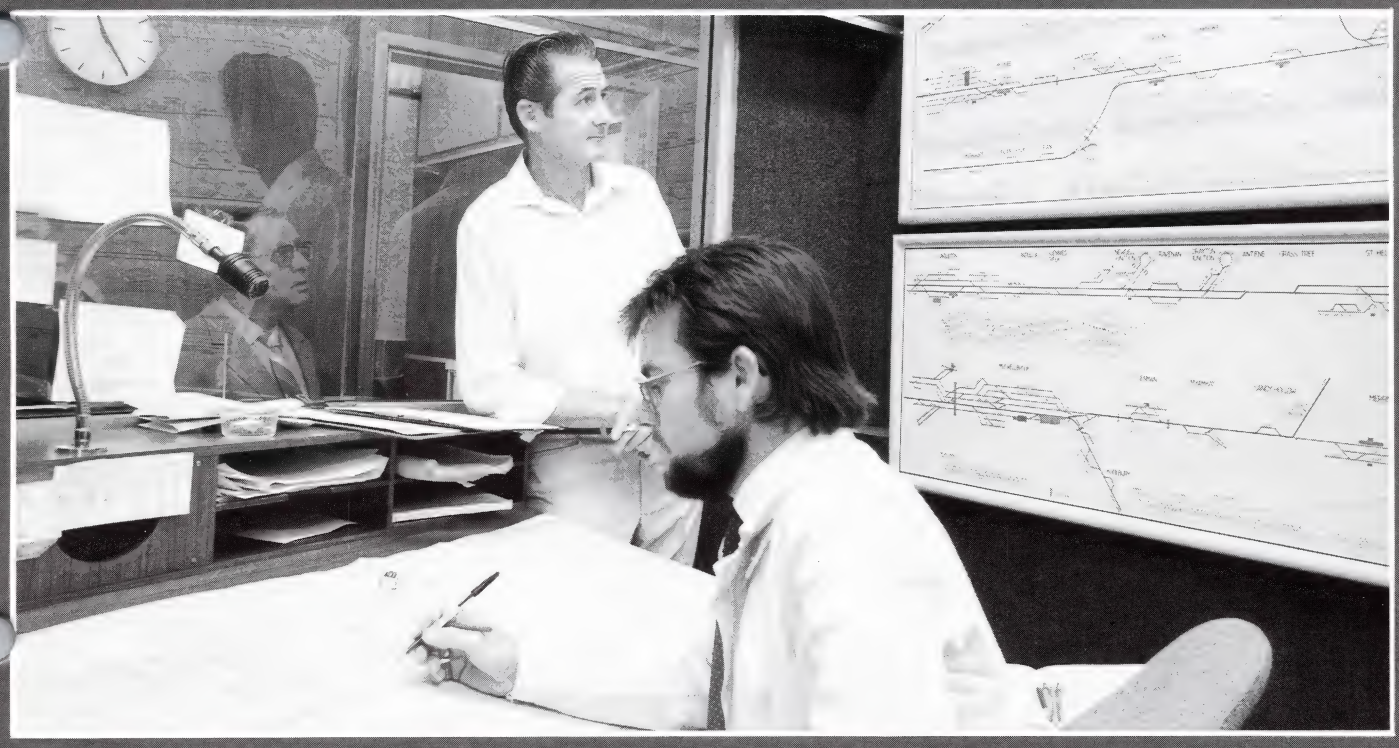
The Broadmeadow Centre operates signals from Awaba to Broadmeadow, Telarah to Casino and from Aberdeen to Werris Creek.

It also oversees the operations of the lines from Wyong in the south, Dubbo in the west, Casino on the North Coast, and Armidale on the Northern Tablelands.

Above: The indicator board and control panel for the Aberdeen to Werris Creek CTC, with area controller Frank King, of Teralba, in control.

Above right: Senior train controllers Ray Young (sitting), of Valentine, and Peter Henderson, of Waratah West, working the main northern line.

Right: State Rail chief executive Pat Johnson talks by radio with driver Reg Barton as area controller Frank King, of Teralba, signals the trains.



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The XPT (Express Passenger Train) just south of Goulburn, N.S.W.

V/Line blue metal train at Kilmore East.

Q.R. General freight train, Rockland.

Westbound passenger train at Crystal Brook, S.A.

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Study cuts wheel wear

A Railways of Australia Co-ordinated Study attempting to reduce high wheel and rail wear on a Westrail heavy haul wood chip operation has produced dramatically improved results.

The study, to generate a computer designed wheel profile to reduce wheel/rail contact stresses has significantly increased wheel life and cut maintenance costs.

The Westrail wood chip operation is a narrow gauge (1067mm) unit train scheme hauling woodchips on the Picton-Lambert railway in the south west of Western Australia.

More than 2.5 million tonnes of woodchips are transported annually from the jarrah forest town of Lambert to the Port of Bunbury, a distance of some 150 kilometres.

The woodchips are hauled in consists of two 1790 km diesel electric locos of Co-Co axle configuration and twenty one 'xo' class four axle/two bogie bottom discharge wagons with an axle load of 19 tonnes.

The wagons are fitted with three piece cast steel bogies with ANZR Class CM 280mm × 140mm journal roller bearings.

The route consists of single tracks with gradients as steep as 1 in 40 and radius curves as sharp as 160 metres. Thirty percent of the narrow gauge track is curved to a radius from 160 metres to 300 metres and the total distance of curved track is nearly 70 km, about 45 percent of the route.

The track consists of 41 kg/metre rail, timber sleepers and crushed stone ballast of nominal 150mm depth below the sleeper base.

The rail is welded in lengths of 27 metres to 110 metres and the outer curves of radius 300m and less are flexibly fastened.

It was decided BHP's Melbourne Research Laboratories (BHP-MRL) would be commissioned to develop a modified wheel profile for the Picton-Lambert track.

Research was co-ordinated by the ROA Engineering Research Manager who produced the design brief and provided liason between Westrail and BHP-MRL and added critical comment advice and guidance throughout the project.

BHP-MRL on its part, undertook to generate a modified wheel profile for testing and monitoring under actual operating conditions.

A number of characteristics relating to wheel/rail interaction were of prime consideration in generating a new computer designed wheel profile.

Three of the major characteristics relate to the contact geometry for a leading wheel set. These are identifying rolling radius, contact angle and wheelset roll angle.

Of these three interacting factors, rolling radius difference is of the greatest significance in predicting vehicle tracking performance, its 'hunting' behaviour, when used in a paired, or bogie configuration.

To provide a wheelset with a degree of self-centering, a rolling radius difference has to be generated when the wheelset is displaced towards the left due to some track irregularity or curvature. The left hand wheel needs to develop greater rolling radius than the right to return the wheelset to equilibrium before flange contact occurs.

As a consequence of this largely curved track, wheel wear on the 19 tonne axle load wood chip hopper fleet was high.

Wheel life for the wagon fleet was short — around 50 weeks — at which time wheels were condemned because of high throat/flange wear. Tread wear did not constitute a problem. Railways of Australia back in 1985 undertook to examine the problem on Westrail's behalf and approached the Broken Hill Proprietary's Melbourne Research Laboratories (BHP-MRL) which was the beginning of the ROA study Number 8 wheel/rail optimisation.

It was already evident from BHP-MRL experience with heavy haul railways in the Australian Pilbara that new conical wheels suffer from high wear rates when initially placed in service.

These high wear rates especially on wheel flanges are largely due to insufficient curving ability and mismatching of wheel and rail surfaces resulting in high contact stresses.

To reduce these effects, modified wheel profiles normally incorporate better curving abilities and more readily compensate for wheel diameter mismatches and bogie alignment faults.

Another important feature of the modified wheel profile is the incorporation of a 'worn in' throat and flange area, the shape of a wheel

Above: Westrail's woodchip operation is a narrow gauge 1067 mm unit train scheme in the South Western jarrah forest region.

Right: Meeting of project team examining implementation of the modified wheel profile (left to right): Mr Rex Middleton, Project Engineer (Rollingstock), Mechanical Branch, Westrail; Mr Michael O'Rourke, Engineering Research Manager, Railways of Australia Committee; Mr Peter Martinovich, Maintenance Engineer, Civil Branch, Westrail; Mr Karl Amsuss, Project Engineer (Brake), Mechanical Branch, Westrail; Mr Ray Littely, acting for Mr C.B. Cornish, Engineering Services Manager, Mechanical Branch, Westrail.

n Westrail woodchip line

that's been in service long enough to wear into a stabilized profile.
This 'worn in' profile achieved in 10 weeks on the Picton-Lambert line is generally then maintained during the remaining life of the wheel.
With all these known parameters, BHP-MRL developed a modified profile and a test-bed wagon consist was set up to assess performance of the new profile.

(continued on page 18)

In June 1986, a standard 21-wagon consist was allocated for the test, using nine of the wagons fitted with the modified wheel profile.

They were arranged consecutively in the middle of the train with six wagons marshalled ahead of the test group and another six behind.

The actual loaded train consist from the two locomotives back was as follows:

- Six wagons not involved in the test.
- Three 'control' wagons fitted with the standard ANZR profiled wheels and the Standard 997mm back to back dimension.
- Three wagons fitted with the modified wheel profile with a reduced back to back dimension of 990mm.
- Three wagons with the modified wheel profile and standard back to back dimension of 997mm.
- Six wagons not involved in the test to complete the train.

Results were assessed after 40 weeks of the train operation in normal service and a number of trends were apparent.

- On the left hand side of the loaded train the new wheel profiles with the 997mm and 990mm back to back configuration showed similar wear rates and patterns.
- On the right hand side of the loaded train the new wheel profiles with the 997mm and 990mm back to back configurations showed similar wear behaviour on the wheel tread.

  However, the flange wear on wheels with 990mm back to back dimension was some 54% less than that experienced on the left hand side of the same axle.
- The Standard ANZR profiles were wearing as expected with an anticipated life of around 50 weeks.

The field trials have shown that a major reduction in flange wear is the factor that determines wheel life . . . and that by introducing the new wheel profile a significant increase in wheel life can be achieved.

Currently as part of ROA Study No. 8 Queensland Railways has also implemented a modified wheel profile with initial wear reduction of over 50% being achieved in trials.

A new intersystem wheel profile has also entered trial service with V/Line and is being prepared for service trials by Australian National, State Rail and Westrail.

Woodchip unit train (XO hoppers) being loaded as the sun rises at Lambert, WA.

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Queensland Railways insta

Queensland Railways will introduce the sophisticated train safety and control system. Automatic Train Control in 'mid' 1988.

The ATC system will be introduced between Caboolture and Nambour, north of Brisbane.

It will mark the first use of A.T.C. for regular traffic operations in Australia.

The new system will extend north to Rockhampton in 1989 as part of Stage 4 of Queensland's $1.05 billion Main Line Electrification programme.

The term Automatic Train Control does not refer to full Automatic Train Control of both powering and braking which could be used in a driverless operation.

Rather A.T.C. denotes a driver supervisory system in which the driver's performance is monitored constantly against fixed information points provided along the track.

This represents a major advance in safety because the elimination of driver errors has not paralleled the very high standard of safety and reliability achieved in modern signalling systems.

The current signalling system being used by Queensland Railways has been modelled on the most up to date practices of British Railways.

Driver error emerged as the most common cause of 246 serious accidents which were subject of public enquiry in the United Kingdom between 1960 and 1981.

Because driver error is the greatest single cause of accidents, Queensland Railways has opted for A.T.C. as a proven driver aid system to reduce the effects of the human factor.

The system was developed by Ericsson Signal Systems at the initial request of the Swedish Railway Administration as a means of reducing the high accident rate on the Swedish Railway Network.

Before the introduction of the A.T.C. system all the information from the signalling system was received and interpreted optically by the driver.

This information is secure up to the point where it is displayed, but the weak link was the driver.

Thus A.T.C. was introduced to provide an independent signals check and brake application.

'Drivers monitored at reference points along the track'

The A.T.C. system can:

- Transmit information from track to track.
- Present the information in such a way that the driver's work is simplified.
- Provide supervision such that the train is driven safely, warn the driver in the event of danger and if necessary, brake the train.

The A.T.C. System can be divided into two parts, Wayside Equipment, and Vehicle Equipment.

The wayside equipment (beacons) mounted on the track between the rails and interfacing with the signalling system (via encoders) provides the source for the information to be transmitted to the train.

The beacons can best be described as semi-inert.

When a train passes over a unit, it receives energy from the vehicle antenna. This energy is received and stored momentarily in the beacon before it starts to retransmit its message to the same antenna.

The information from the track can be as follows:

- permitted speed levels;
- advanced warning of impending speed levels;
- distances (for braking application);
- track gradients;
- special information of various kinds.

The Vehicle Equipment includes the following units:

Antenna: to collect information from wayside equipment. The antenna is designed such that its information collecting ability is extremely reliable even under such severe conditions as heavy rain or the beacons being completely covered with contaminated ballast.

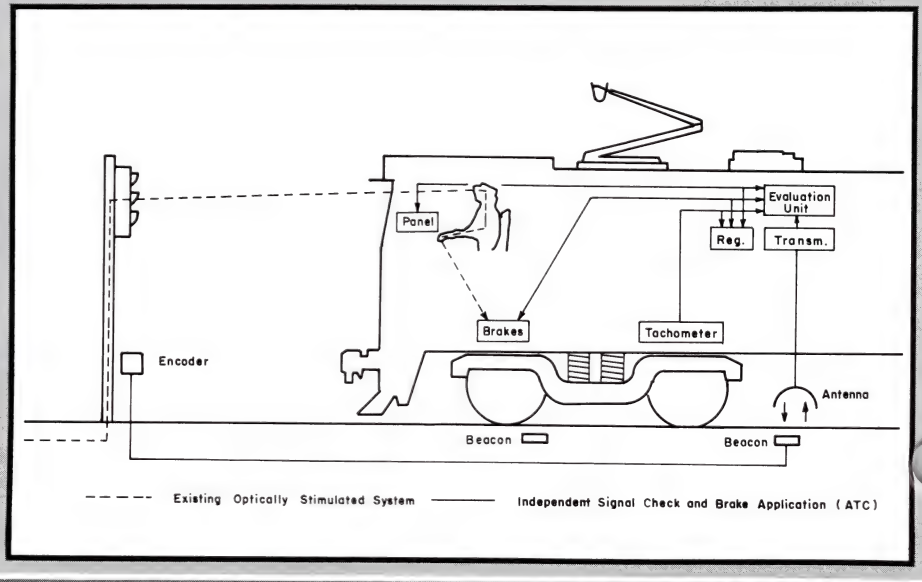
Its operating frequency has been selected to avoid problems associated with interference from an electric traction environment and the information received is continuously checked by the evaluation unit and the computer on board the train.

Logic Unit: to evaluate and process information for display or action. The processing is carried out with two independent programme sequences that work simultaneously.

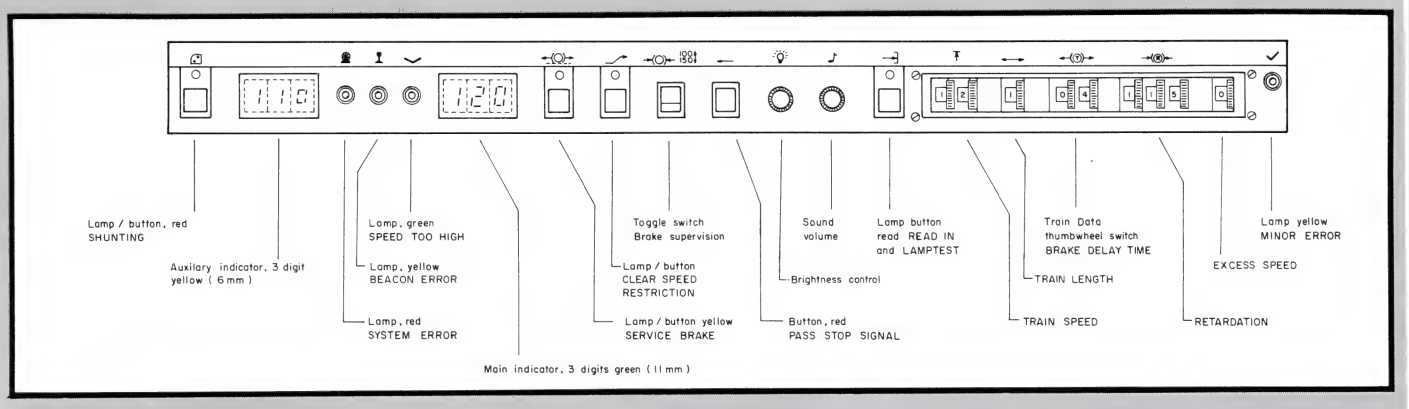
The processing of these two cycles is then compared before moving on to the next step in a given sequence of events.

Panel: to supply information to the driver.

The display panel mounted along the top of the instrument panel provides both visual and audio information.



a major advance in safety



On the right hand side are a number of thumb switches for entering specific train parameters, such as braking capacity, train length and maximum speed.

The driver is always advised if he is approaching a signal at which he is required to stop.

This is achieved when the train passes the advance beacon for the signal where the A.T.C. equipment on the vehicle receives and processes the information on the distance to and the aspect displayed on the approaching signal.

According to the pre-entered data on the train's braking capacity and the registered target distance, the point at which braking must commence is calculated.

When the train reaches this point the display informs the driver that braking must begin.

He now has a five second limit to commence braking. If he does not respond the display panel registers an alarm.

The system continuously calculates train speed against distance to determine the projected stopping position.

If this position is determined to be beyond the next signal the system will increase the braking force sufficiently to reduce the speed to zero before the next signal is reached.

The benefits occur in three areas and can be summarised as follows:

Economic:

- accident prevention;
- reduced track and vehicle wear and damage caused by excessive speeds;
- reduced goods damage by improving overall train performance and handling;
- more efficient and reliable timetabling;
- driver only operation.

Safety:

- the A.T.C. equipment provides a support system for the driver in that the driver knows that should he have a lapse of concentration or make an error the A.T.C. system will prompt him or take over controlling the train's speed to ensure that the train is operated safely;
- selective speed restriction for different train types can now be ensured.

User Acceptance:

- both driver and public user confidence will be boosted with the provision of this system thus reducing driver stress and associated illness;
- allows less experienced drivers to maintain timetabling.

The Cost. The cost of installing the A.T.C. system between Caboolture and Rockhampton amounts to $17 million and this provides for the fitting of all trackside equipment as well as train borne equipment on all electric trains operated between Caboolture and Rockhampson.

Future Applications. The installation of A.T.C. on the North Coast Line between Caboolture and Rockhampton will provide the opportunity for Queensland Railways to gain significant operational experience with this system so that its application to other parts of the Queensland Railway network can be evaluated.

Other logical applications would be the proposed Gold Coast Railway and the Brisbane suburban commuter network.

At present the Brisbane suburban network is equipped with a less sophisticated driver support system, the Advance Warning System (AWS). AWS repeats signals inside the cab as a memory aid to the driver and ensures the driver's vigilance in observing signals in that it requires the driver's acknowledgement of all signals of a restrictive aspect.

The AWS system represented the state of the art when installed and while it does not provide the level of support associated with A.T.C., it is the level of driver support currently in use on most railways throughout the world.

Queensland Railways carried a record 60.58 million tonnes of coal in 1986-87. This compared with 58.96 million tonnes in 1985/86, the previous record.

Export coal in 1986-87 totalled 55.03 million tonnes through the ports of Hay Point and Dalrymple Bay, just south of Mackay; Gladstone, and Abbot Point near Bowen.

Annual tonnage of coal hauled in 1990-91, both export and domestic, is expected to exceed 70 million tonnes. This compares with 40 million tonnes in 1980.

The progressive phasing-in of electrification on the coal lines in Central Queensland is preparing Queensland Railways for the increased traffic task.

Regular electric-hauled coal trains began service between Peak Downs and Hay Point on May 29, 1987.

Up to five electric locomotives haul trains of up to 148 wagons with an all-up weight of 10,500 tonnes.

AN looks sharp . . . it

In spite of Australia's depressed new motor vehicle market, Australian National is taking an aggressive approach to marketing car carrying.
The manufacture of triple deck car carriers is one of the many initiatives taken by the rail industry to lift levels of service and therefore customer satisfaction.
Fifteen triple deck car carriers have been manufactured by Australian National and a further 18 are proposed for 1988/89.
They give a 50% increase in payload for an 18% increase in tare weight.
Converted from existing double deck units the wagons were fitted with resilient constant contact side bearers to eliminate 'rock' and reduce bogie hunting.
Side columns had to be strengthened on each wagon to cater for sway forces. Rail tracks at Port Augusta were lowered to cater for the increased height.
Other initiatives include the 'ANCARS' velvet glove handling system for motor vehicles.

Central to its objective is the reduction of handling and transit damage on all rail routes.

It consists of a training program already offered to car loading gangs at Islington Freight Centre and the issue of new 'soft' uniforms without buttons, buckles and belts to give car handlers a real opportunity to aim for zero handling damage.

Other changes to motor vehicle handling at Australian National include the use of a computer based Vehicle Distribution Management System (VDMS) operated by Reynolds & Reynolds and part of a nationwide Haulier network for the management of Holdens cars.

A security system has been installed at Islington comprising a perimeter beam detection alarm system supported by a series of closed circuit TV cameras.

By the time the industry realises a turnaround, rail will have enhanced its performance and be in a position to offer an efficient and reliable service for new motor vehicles.

Meanwhile, an entertainment car equipped with video games and private booths, hairdressing salon and games area, is now a regular feature of Australian National's Ghan passenger service operating between Adelaide and Alice Springs.
Since making its debut on August 3 this year, the car is attracting an ever-increasing number of patrons enjoying the unique facilities while being ferried to and from Australia's 'red centre'.
Undoubtedly the car will accommodate even greater numbers when legislation to allow the installation of train poker machines is passed through Federal Parliament.
However even without the machines, the car represents an exciting new concept in passenger services.
Apart from its modern salon, souvenir and bookshop, the car houses five individual television monitors enabling travellers to watch privately hired movies.
The special games area for pastimes such as backgammon, scrabble, cards and other board games reverts

1. *David Nowell . . . a facility unique to train travel.*
2. *Hairdresser Mary Wilson attends to a customer in the car salon.*
3. *And shows a range of videos for hire.*
4. *The entertainment car provides a spacious games area.*
5. *Customers can relax in the private video booth area.*

all part of the service

to a mini theatre during the course of the journey for 'cinema style' viewing. The car, its staffing and facilities are operated by an SA based company called Alpha Electronics.

Alpha's Director, Mr David Nowell, said the introduction of the car provided a facility unique to train travel, "anywhere in the world."

AN's passenger business manager, Mr John Smith, said the entertainment car enhanced the total trip experience for passengers.

"Being a no smoking, drinking or eating area, it's particularly appealing for family-style entertainment," he added.

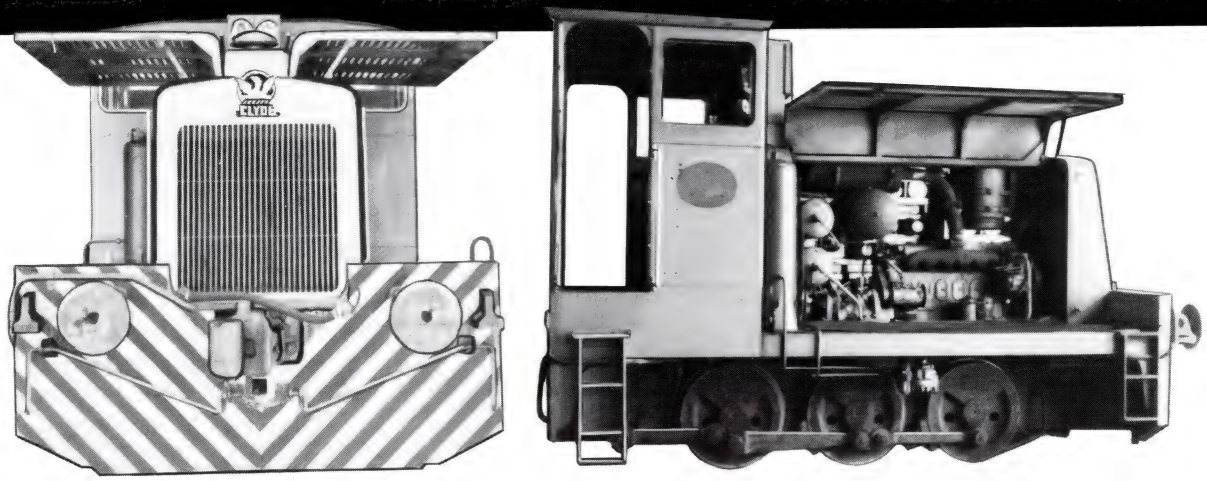
Mr Smith said the car was the first step in AN's plans to develop a total 'liner' concept tourist experience for passengers.

"It's part of our aim to continually strive for improvement to all of our passenger services," said Mr Smith who's also conducting a critical review and upgrading of the Ghan service.

Islington car compound with ANCARS uniformed handler.

The new triple deck carriers increase vehicle load by 50% for an 18% increase in tare weight.

TENDER FOR DIESEL LOCOMOTIVE



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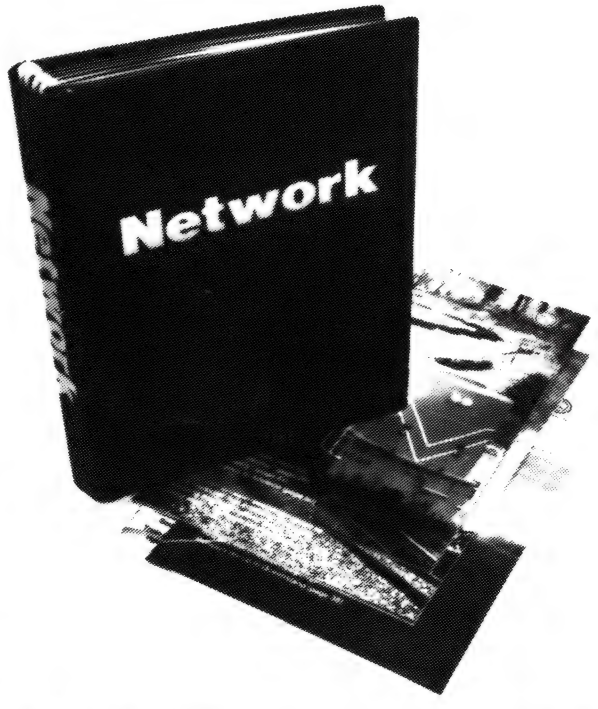

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DESIGNING LOCOMOTI

By Roger Ford

Railways seeking to reduce inter-city journey times have a choice of two strategies.
One is to build entirely new railway lines aligned for high speed operation. While this allows trains to run at sustained speeds of up to 300 km/h, the cost and environmental impact of the new lines is high.
For the past 20 years, British Rail has followed the second strategy of running trains faster on existing tracks. Progressive development of traction units and rolling stock has resulted in a network of 200 km/h diesel powered High Speed Trains (HST) with the fastest services averaging over 160 km/h.
Developed for routes like those from London to Edinburgh in Scotland and Bristol in western England, which, although built in the 19th century, are aligned for high speed running, the HST has twin 1,680 kW power cars at each end of a rake of up to eight coaches.
Its key features are the lightweight, powerful, Paxman Valenta diesel engines which give the power needed for sustained operation at 200 km/h, and the disc brakes which allow the train to stop at that speed in the same distance as a conventional train running at 160 km/h.
They enable the HST to run 25% faster on existing track with standard signalling.

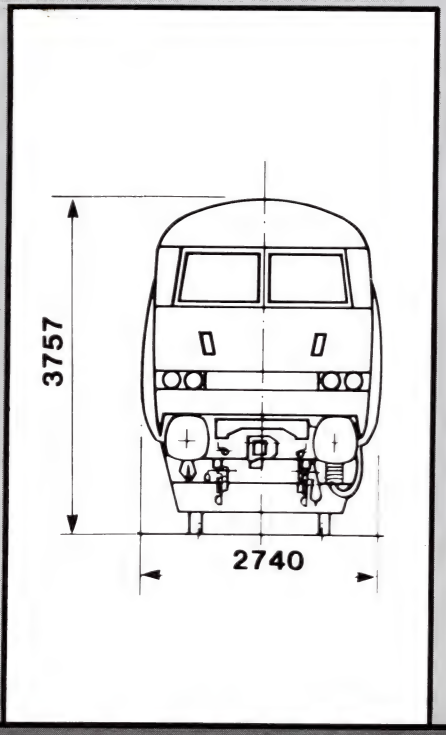
Tilt Technology

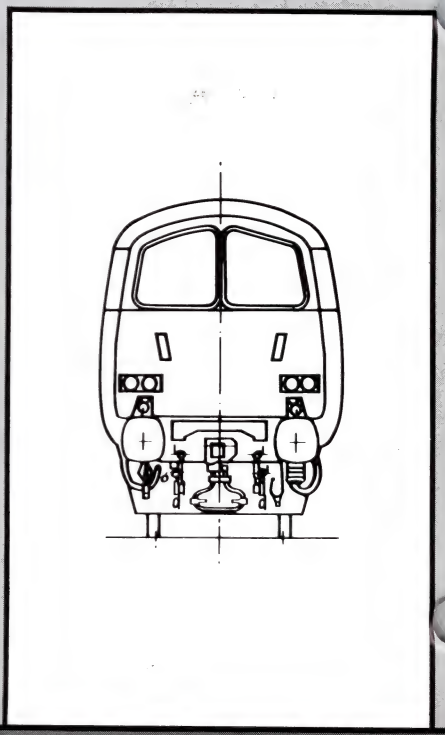
On other main line routes in Britain, curvature limits high speed running. The limiting factor is passenger comfort.
In its experimental Advanced Passenger Train (APT), British Rail isolated passengers from the increased centrifugal force at higher curving speeds by making the coaches tilt.
British Rail therefore entered the 1980s with two approaches to cost effective high speed operation on existing track.
For suitably aligned routes, extensive experience with HST had shown the way forward with conventional technology.
On routes where curvature restricted line speeds, tilting train technology was available.

The first requirement for a new generation of high speed trains came with the authorisation in 1984 of the electrification of the east coast main line.
This will require a fleet of 31 high power, high speed locomotives and trains.
However, the traction requirements for a single route cannot be taken in isolation.
British Rail has also had to consider the future needs of the London-Glasgow west coast main line, which incorporates a number of severely curved sections.
This route was electrified throughout in 1974 and will need to replace its existing locomotives and trains in the 1990s.

Extra Power

The requirements of these two routes determine the design of the Electra locomotives being supplied for the east coast main line by GEC Transportation Projects.
Manufactured by British Rail Engineering, and utilising innovative engineering, Electra is designed to run at 225 km/h (occasionally up to 240 km/h) on the east coast main line and to haul future tilting trains on the west coast route.
To maximise its use, Electra will also have the power needed to haul heavy overnight sleeping car trains over steeply graded routes.
For a locomotive capable of running at 240 km/h the design of the bogies and running gear is critical.
High speed running increases the forces between wheels and track.
Hauling tilting trains through curves at cant deficiencies (uncompensated lateral acceleration) of nine degrees (9% of the force of gravity) further increases these forces and therefore track wear.
To reduce track forces, the mass of each pair of wheels and their axle plus the mass of the bogies must be minimised.
In Electra this is achieved in several ways.
First, the traction motors are suspended from the body but within the bogie.
This reduces the bogie mass, leaves more space in the body for equipment, produces a shorter and lighter locomotive and lowers the centre of gravity which is important in high speed curving.
The only equipment mounted on the bogie is the final drive right-angle gear box and coupling which transfers the power from the motor to the axles.





ES FOR HIGHER SPEEDS

Novel Linkage

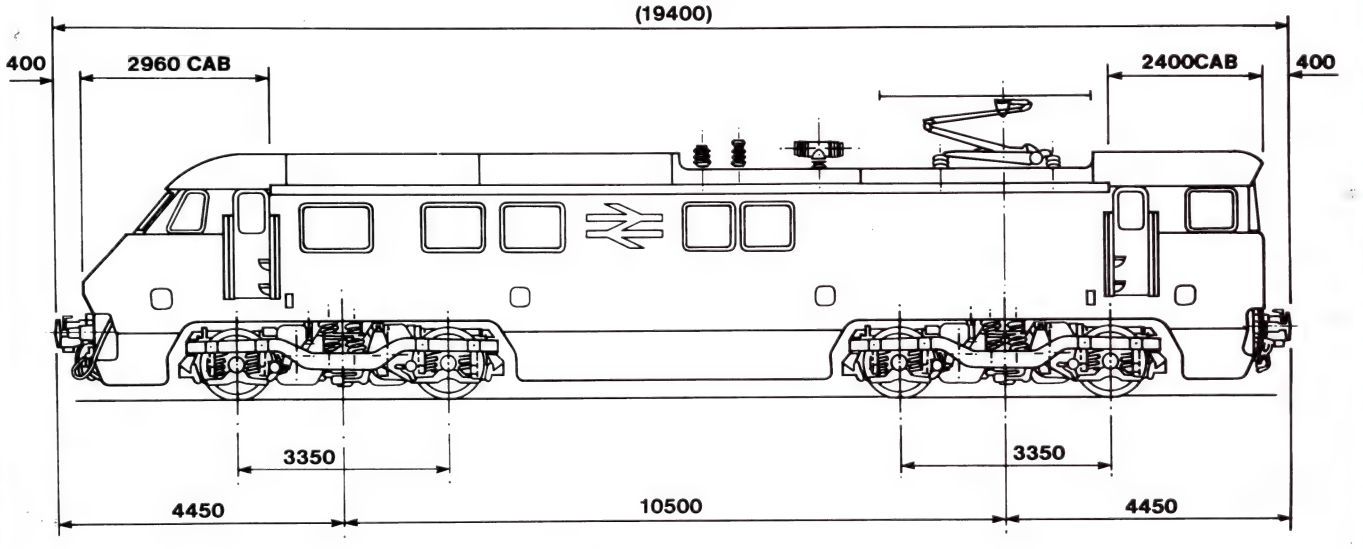
To minimise the unsprung mass of each axle, the Davies and Metcalfe disc brakes are mounted on the free end of each traction motor shaft.
To transmit traction and braking loads, a novel traction linkage system replaces the traditional traction centre (which is no longer practicable due to the position of the traction motor).
On the east coast main line, Electra will haul 600 tonne trains of ten coaches — including a driving trailer for push/pull working — at up to 225 km/h.
On overnight trains it will also be required to haul 830 tonne sleeping car trains.
It is this duty, and not the high speed running, that determines the Electra locomotive's maximum power rating of 4,700 kW at the rail.
The electric propulsion equipment has direct current traction motors — two for each bogie — with separate control of the motor field excitation.
Both the motor field and armature currents will be controlled by separate thyristor converters under microprocessor control.
The central microprocessor is the key to Electra's high performance, being responsible for load sharing between individual traction motors and between the two bogies, to ensure optimum performance.
It will detect and correct wheel slip and slide by comparing the acceleration or deceleration of each axle with the maximum performance of the locomotive.
Doppler radar will be used to provide an accurate reference signal for creep control where motors are controlled to slip at up to 15% above true speed for maximum use of adhesion.

Areas Controlled

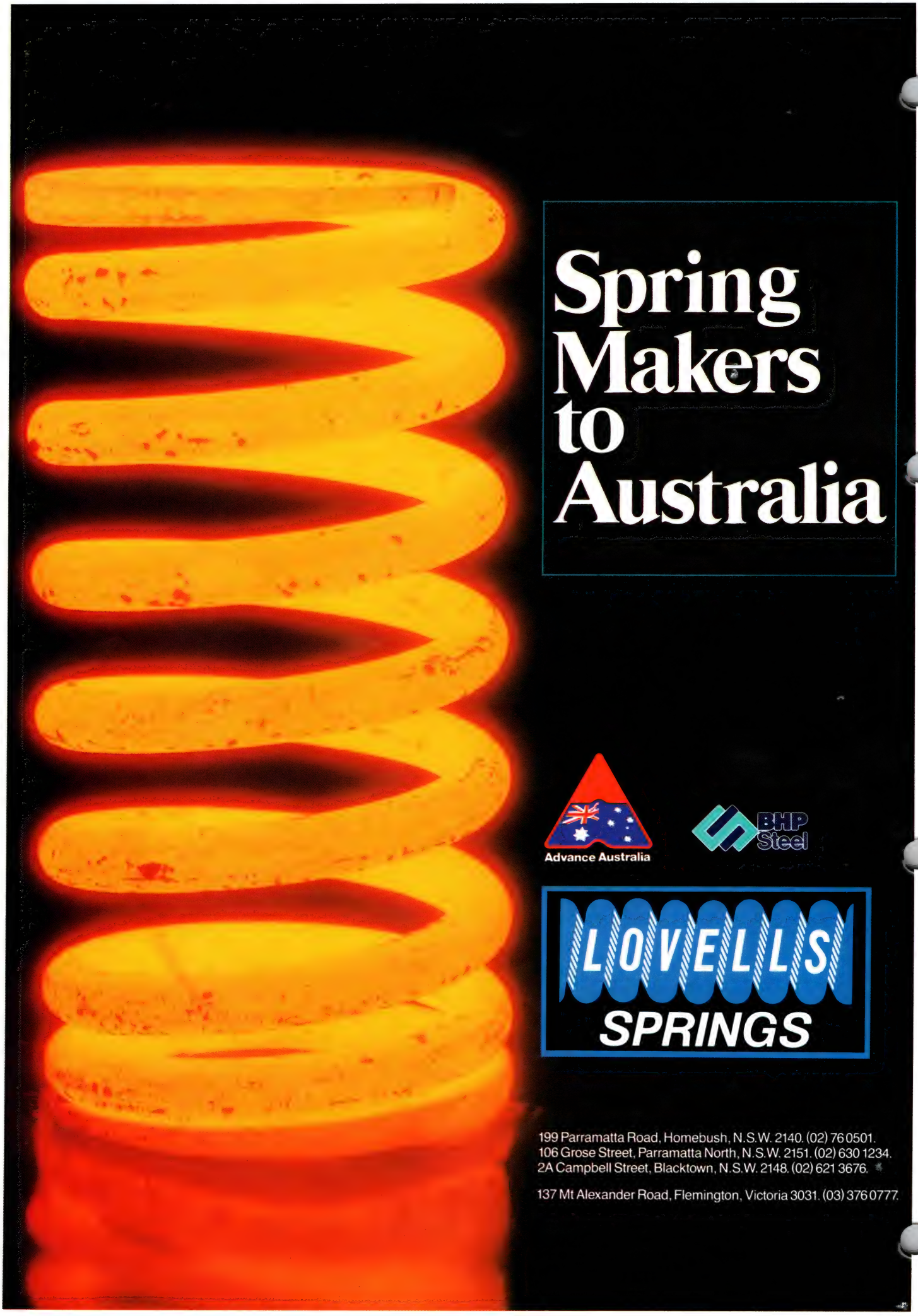
The microprocessor will also control tractive effort when motoring or when the locomotive's electric brake is in use, to give optimum output within the performance limits for the electrical equipment.
It provides the interface between the electronic time division multiplex (TDM) remote control system and a driving trailer or another locomotive in multiple.
Other systems under its control include blending the mechanical braking with the locomotive's electric brake and the various locomotive safety interlocks and train safety systems.
British Rail has recently ordered the coaches that Electra will haul from Metro-Cammell.
Known as the Mk 4 coach, each vehicle will be 23.5m long, built in steel.
The contract covers the supply of 217 first and second class coaches, 34 catering vehicles and 32 driving trailers which also include van space.
The coaches will run on the new T4 high speed bogie developed by British Rail Engineering Ltd which will also manufacture the body shells under subcontract to Metro-Cammell.

Future Developments

Electra and the Mk 4 coach have considerable potential for operation at higher speeds.
Together they form the basis for the British Eurotrain designed to run through the proposed Channel tunnel between Britain and France and suitable for operation at speeds in excess of 300 km/h on the emerging European high speed rail network.
Each Eurotrain will have 14 coaches marshalled between two 5000 kW power cars derived from the Electra locomotive.
The power cars will have three phase alternating current drive, able to operate on the various European electrification systems, including direct current supplies.
Eurotrain is being developed by a consortium of British companies including British Rail Engineering, Brush Electrical Machines, GEC Transportation Projects, and Metro-Cammell.



The British Rail Class 91 locomotive (dimensions in millimetres)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4 Wheel wagons a dying breed at V/Line

The long lines of rusty old V/Line wagons are disappearing.

With block train running and the closure or upgrading of the remaining light lines, the small four wheel wagons are being rapidly replaced by modern high capacity bogie wagons.

By 1990, V/Line will have a fleet of around 5000 bogie wagons compared with only 10,000 two years ago and 22,000 wagons in the early 1970s.

By running fewer, larger and more reliable freight trains on each corridor, V/Line will substantially reduce operating and maintenance costs of rolling stock.

The grain fleet now comprises 700 bogie wagons which easily do the work of around 6000 wagons used to carry the grain harvest in 1980-81.

Under the Wagon Disposal Project, V/Line will scrap up to 6000 old wagons by 1990.

At the end of 1987, nearly all the four wheel wagons (mainly grain and livestock wagons) in storage will have been cleared for sale.

The disposal of the first batch of almost 3000 wagons in storage is expected to recover approximately $2 million for V/Line — including the sale of salvageable items.

From 1988 to 1990, another 2500 old wagons or more, will be withdrawn from service as part of a continuing program of wagon replacement in the V/Line rolling stock fleet.

Most of the wagons in storage are being sold by tender on an "as-is-where-is" basis.

The disposal of the wagons is being administered by the Priority Projects Department of V/Line's Transport Operations Division.

This is one of its commercial projects which is making an important direct cash contribution to V/Line's capital works program.

The Bendigo Workshops have scrapped 600 wagons in the first batch of 3000 wagons.

The remainder have been sold to the scrap metal dealers — Simsmetal Ltd and Steel and Alloy Products, A-Asia Pty Ltd.

The wagons brought in on rail from outside Bendigo are mainly coming out of service, not out of storage.

The sale contracts require these in-storage wagons to be transported by road at the contractor's expense.

The wagons involved and the closed lines on which they are mostly located, are unsafe for further use.

With regard to salvageable items, V/Line's Priority Projects Department, through the clerk of works in each salvage area, clearly identifies all saleable or re-useable assets such as shunters' steps, coupler knuckles, air brake components and other items.

V/Line has established an inventory of all spares in co-operation with the wreckers. All sales are separately accounted for.

V/Line has put several hundred new bogie wagons into service in recent years.

These are capable of carrying about 2.5 times the tonnage at speeds of 80 to 100 kilometres per hour compared to the old four wheeled wagons which carried only 22 tonnes of freight at a top speed of 65 kilometres per hour.

Illuminating Challenge at Mt Newman

This article describes the lighting and electrical design for railyard improvements for Mt. Newman Mining Co. Features of the design are the 'medium mast' rather than the high mast lighting, shadowless lighting of the railyards and the economical HV connection of the transformers.

The design was developed by M.D. Sage of Bassett Consulting Engineers (Electrical and Mechanical Consulting Engineers) with P.C. Reed of Maunsell and Partners (Civil and Structural Consulting Engineers), and D. Bitney, L. Hill, W. Kirby, L. Downs and A. Bartley of Mt. Newman Mining Co.

Investigations

An investigation of existing lighting at Port Hedland railyard was conducted. The lighting was provided by groups of four 1000W metal-halide, high bay luminaires on 30m masts.

The illuminance levels and uniformity complied with the standards of the early 1970s, but were not up to present standards, the lamp life short (6000h), and the luminaires had to be lowered when a cyclone approached.

There is no Australian code of practice for railyard lighting and international codes vary.

The British I.E.S. recommended 2-3 lux in 1969.

The North American I.E.S. Handbook of 1981 tables illuminances between 20 and 50 lux for various parts of railyards.

To assess current practice, visits to Westrail's Avon Yard and Picton Yard were arranged.

To determine design criteria a second investigation was conducted at Port Hedland where yards would be used for 24 hours a day inspection of ore-cars.

To establish the tasks in an inspection yard, a railcar examiner was accompanied on a night inspection.

One examiner drives a utility vehicle while his mate proceeds on foot with a torch inspecting wheels, bearing and brakes.

After analysing the task the following conclusions were reached:

- A level of background lighting better than that existing at Port Hedland was needed. An average horizontal illuminance of 25 lux was recommended. This accords with the North American I.E.S. Handbook and Westrail's current practice.
- Shadows cast by the railcars should be eliminated and some vertical illuminance on the side of the railcars would be appropriate. A row of floodlights on each side of the yard was thus necessary.
- Uniformity of 0.2 min to max was recommended.
- Glare towards a loco driver must be minimised.
- Colour was not critical.

Lighting design

The poles were selected from the following criteria.

- The poles would have to withstand a cyclone with floodlights in position. 30m masts were found to be ten times the cost of 18m masts when designed to avoid excessive deflection during a cyclone.
- A cherry picker truck with a reach of 17.75m would be available.
- Local manufacturers produce hinged 18m poles. This allows the floodlights to be maintained at ground level.
- Some of the poles would be in a mangrove swamp. The pole bases in the swamp are expensive and even more so with tall poles.

From these criteria 18m poles were selected.

Lamps compared were high pressure, sodium, mercury vapour, metal-halide and low pressure sodium. The high pressure sodium lamp was chosen because of its long life, high efficiency and good hot-restrike characteristics.

A number of floodlights were considered in the 2 × 250/2 × 400/1 × 1000W range. One requirement was good weatherproofing, and IP55 classification was recommended.

A further requirement was good light output and tight glare control.

An asymmetric, fast run back, beam was needed. The Philips SNF011 floodlight satisfied these requirements.

Electrical design

For the electrical distribution, many small transformers with short MV cable runs were chosen. Eleven kV power was run the length of the yards and 50 kVA transformers placed at intervals of about 800m.

Three-phase, four-wire MV lighting circuits were chosen for economy. As high pressure sodium lamps are sensitive to voltage variations, circuits were designed to keep the voltage drop below 2.5%.

Each lamp was supplied through its own fuse and control gear tapped for 240 V and 250 V.

Overhead lines were initially considered for both HV and MV distribution. It would have been economic to use the floodlight poles for the overhead lines but the use of hinged poles prohibited this.

The cost of pole bases in the mangrove swamp was high so that the most economical HV distribution was overhead on the rocky ground and underground in the swamp.

The HV cables were installed 900mm deep, and the MV cables 600mm deep, in a common trench.

An oil fuse-switch was installed at the end of the overhead line to protect the underground cable and to limit fault current.

V/Line helps out with NSW grain

For the movement of NSW wheat through the silos at Oaklands to the Geelong export terminal, V/Line has proved the superiority of its road/rail organisation over direct delivery by private road contractors.

In successfully moving 100,000 tonnes of wheat from fourteen silos around Oaklands, V/Line organised an efficiently integrated road/rail service utilising the relative advantages of each transport mode.

Road is more suited to shorthaul movements, particularly for the consolidation of smaller grain tonnages to a larger receival site which is serviced by big block trains.

Such a system is a feature of the new grain network in Victoria, where a number of light lines (incapable of carrying the heavier locomotives and rolling stock) have been closed.

Trucks are used to consolidate stocks from storages on those lines to central receival points situated on main lines.

V/Line provides the road business for over 300 contractors around the State through its Fast Track general freight and grain freight services.

The Transport Resources Department of the V/Line Freight Services Division, under the management of Vincent Lyneham, has become one of the biggest road contract administrators in Victoria with a reputation for getting things done quickly and competitively.

"We use road services as a vital complement to rail," said Vince.

"V/Line has a multi-modal charter to provide competitive and co-ordinated services with the most appropriate transport mode.

For road freight, we have a reliable network of operators capable of any task at short notice.

We have set strict professional standards for cost calculation and road contract negotiations.

We work in with rail services on the longer distances, especially with grain freight, because the comparative advantage of trains is for the long and heavy line hauls without shunting and marshalling en route.

For the movement of wheat through Oaklands, we organised meetings with all government departments and authorities involved, shire councils and others.

We worked out the routes and tonnages of specified wheat grades from each grain handling site and co-ordinated their movement with the road contractors and with our Transport Operations Division for the twice daily block train service from Oaklands."

During July and August there were more than fifty trucks a day between the fourteen storage sites and Oaklands.

Integrated road/rail service moves 100,000 tonnes to Geelong

The trucks had an average round trip of 226 kilometres.

They were bringing in around 3700 tonnes a day in more than 150 truck loads.

The block trains from Oaklands had forty bogie wagons each with a total net load of 2200 tonnes of wheat.

At a weekly clearance rate of up to 18,000 tonnes a week, the 100,000 tonne allocation was delivered to Geelong before the end of August with a scheduled 1851 wagon loads for the job.

V/Line negotiated with the Australian Wheat Board (AWB) for the road/rail movement.

The successful sub-contractors for the road task were members of the Riverina Grain Handlers Association — a co-operative group of private road operators.

Individual truckers have expressed their support for the road/rail combination.

They earn more (on a cents per loaded kilometre/tonne basis) and use less fuel on the shorter hauls, with consequent savings.

Overall, the road/rail combination delivered the wheat twice as fast to Geelong, on the basis of the best weekly clearance rates, compared to the straight road alternative.

In its submission to the Royal Commission into Grain Storage Handling and Transport, V/Line supported the concept of grain movement across State boundaries to the natural terminal port.

It makes economic sense for the grain industry to arrange to move grain along least-cost routes, regardless of State boundaries.

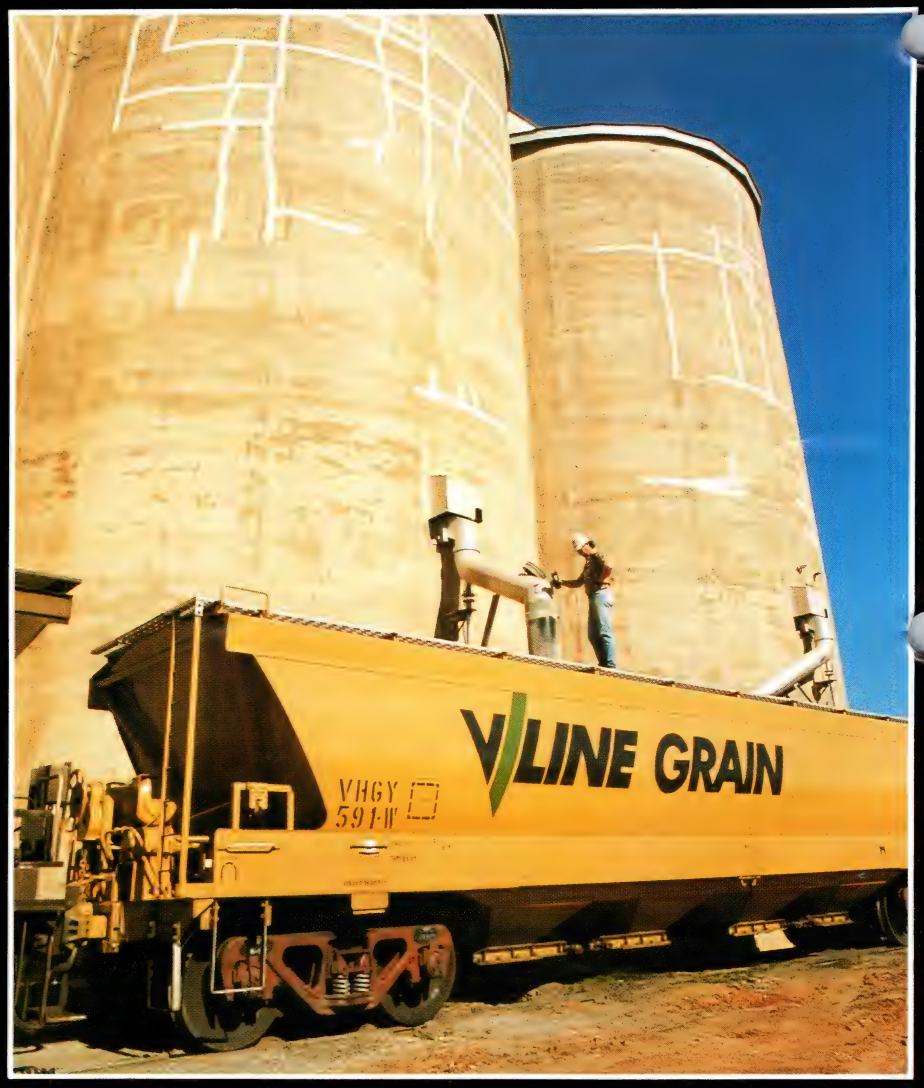
Victoria (V/Line) and South Australia (AN) have come to an agreement whereby wheat off the Panitya-Ouyen line is moved to Port Adelaide and a compensating amount of grain is railed from south-east South Australia to Portland.

"There is certainly greater scope for an increased flow of southern New South Wales grain," according to V/Line's Senior Marketing Manager, Maurice Barclay.

"If total marketing costs were taken into account — including port charges, shipping costs, seafreight charges as well as land freight costs, there would be greater use of Portland on the basis of the savings that accrue by loading larger ships.

"Furthermore, the current subsidy of New South Wales freight rates inhibits the economic flow of grain to the natural terminal.

The parochial, border-defending nature of grain handling and transport in Australia distorts the least-cost flow of grain and adversely affects Australia's competitiveness on world markets," Maurice said. "V/Line has shown that everyone is better off with a properly organised, integrated road/rail system bringing in the southern New South Wales wheat."



V/Line successfully moved 100,000 tonnes of New South Wales wheat from Oaklands to the Geelong export terminal during July and August. Fifty trucks were used to ferry 3700 tonnes each day from fourteen storage areas to Oaklands for the rail transit.

$27 million Maintenance Depot for V/Line

The State Transport Authority of Victoria is currently constructing a Maintenance Depot within its main Spencer Street, West Melbourne rail complex for maintenance and servicing of the V/Line fleet of country carriages.

The project will cost in excess of $27 million.

The project includes an 8,000 square metre building complex with provision for seven "roads" or rail lines with access to an extensive range of services.

These will permit the maintenance or replacement of carriage parts, minor repairs, cleaning and replacement of consumables.

Of the seven roads, five are equipped for light maintenance and servicing with access from elevated platforms between the roads.

Overhead carriage access is provided from continuous suspended catwalks and a monorail allows for servicing or replacement of carriage-roof mounted equipment.

The remaining two roads are designated for heavy maintenance and servicing and are equipped with a 15 tonne overhead travelling crane, column mounted jib cranes and inspection pits for access beneath the carriages.

The depot complex together with associated roadways and paved areas embrace a site area of 1.3 hectares.

A two level annex at one end of the building serves as a workshop and an annex along the east side houses a store, administration offices, plant areas and staff amenities.

Building services are extensive including heating and cooling, fume extraction, low and high voltage electrical power, trade waste collection and treatment and water and compressed air reticulation throughout the complex.

Electrical power to equipment is controlled by a network of programmable controllers.

Consulting engineers, Hardcastle & Richards Proprietary Limited assembled a multi-disciplinary team within its Melbourne office to undertake all aspects of design and documentation of the project earthworks, foundations and building structure and building services.

H & R's project leader, John Noonan said the design was undertaken by a team comprising an architect with mechanical, electrical and civil engineers and drafting resources with experience in each of the disciplines involved.

The V/Line Carriage Maintenance Depot building is approximately 160 metres long by 60 metres in width, incorporating seven roads for minor and major maintenance, provisioning and servicing of country rail carriages.

The $27.2 million project is scheduled for completion towards the end of 1989.

Construction management is being undertaken by V/Line.

Riding the 'Cariboo Dayliner'

By Morgan Lawrence

If you and your family are looking for a journey through some of the world's most spectacular scenery on your next vacation, you will not go wrong travelling British Columbia Rail's (BC Rail) "Cariboo Dayliner."

Statistics abound on the engineering feat of building BC Rail, Canada's third largest railway.

Begun in 1912, in two years 12 miles of rail had been laid from Vancouver, paralleling the rugged mountainous shoreline of Howe Sound to Horseshoe Bay.

Fifty years later, known as the Pacific Great Eastern Railway, the line reached its northern terminus Prince George, a distance of 463 miles.

As recently as 1964, the journey took a slow 36 hours — assuming the train was on time! Today, it's a 13 hour trip.

On the "Cariboo Dayliner," BC Rail provides its riders an attractive brochure vividly describing the scenic route through British Columbia's heartland.

Operating year around, it runs three days a week — Sunday, Wednesday and Friday northbound; Monday, Thursday and Saturday southbound between north Vancouver and Prince George, B.C.

Arriving Sunday morning at BC Rail's North Vancouver depot, I discovered people eagerly cued seeking space aboard the "Cariboo Dayliner."

Fortunately, I had wisely booked the rail excursion in advance.

The train's consist includes individual reclining seats reserved numerically in first class; open seating in second class.

First-class ticket includes breakfast, lunch and dinner, served at your seat.

Second class offers continuous food-vendor service of sandwiches, pastries and beverages moderately priced.

Departing 7.30 a.m. sharp, the sold-out-six-rail-diesel-car stainless steel train got underway heading west, then northwest on its all-daylight run to Prince George.

Colourful names of Squamish, Cheakamus Canyon, Lillooet, Ahbau (ah-boo), and Lac La Hache enumerate peoples indigenous to the region.

From the rightside of the train heading north between mile posts 39-47 one can view majestic Mount Garibaldi rising 8,787 feet in all its snow-capped splendour.

Winding through gorges of the Coastal Mountain Range, the panorama includes Cheakamus Canyon along the Cheekeye River ("Cheakmus" is Indian meaning "those who fish with cedar rope nets" — still practiced today), and 300 foot Brandywine Falls seen from the railbridge of the same name.

At 9.50 a.m., the train stops at Whistler, near the Blackcomb Mountains, gateway to the very popular Whistler Resort area.

Year-round recreational facilities include championship golf courses, ski lodges and a challenging network of horseback and hiking trails.

Continuing to Alta Lake, the line reaches the summit pass of the coastal range and then due west descends into the fertile Pemberton Valley, named for Joseph Pemberton a Hudson's Bay surveyor.

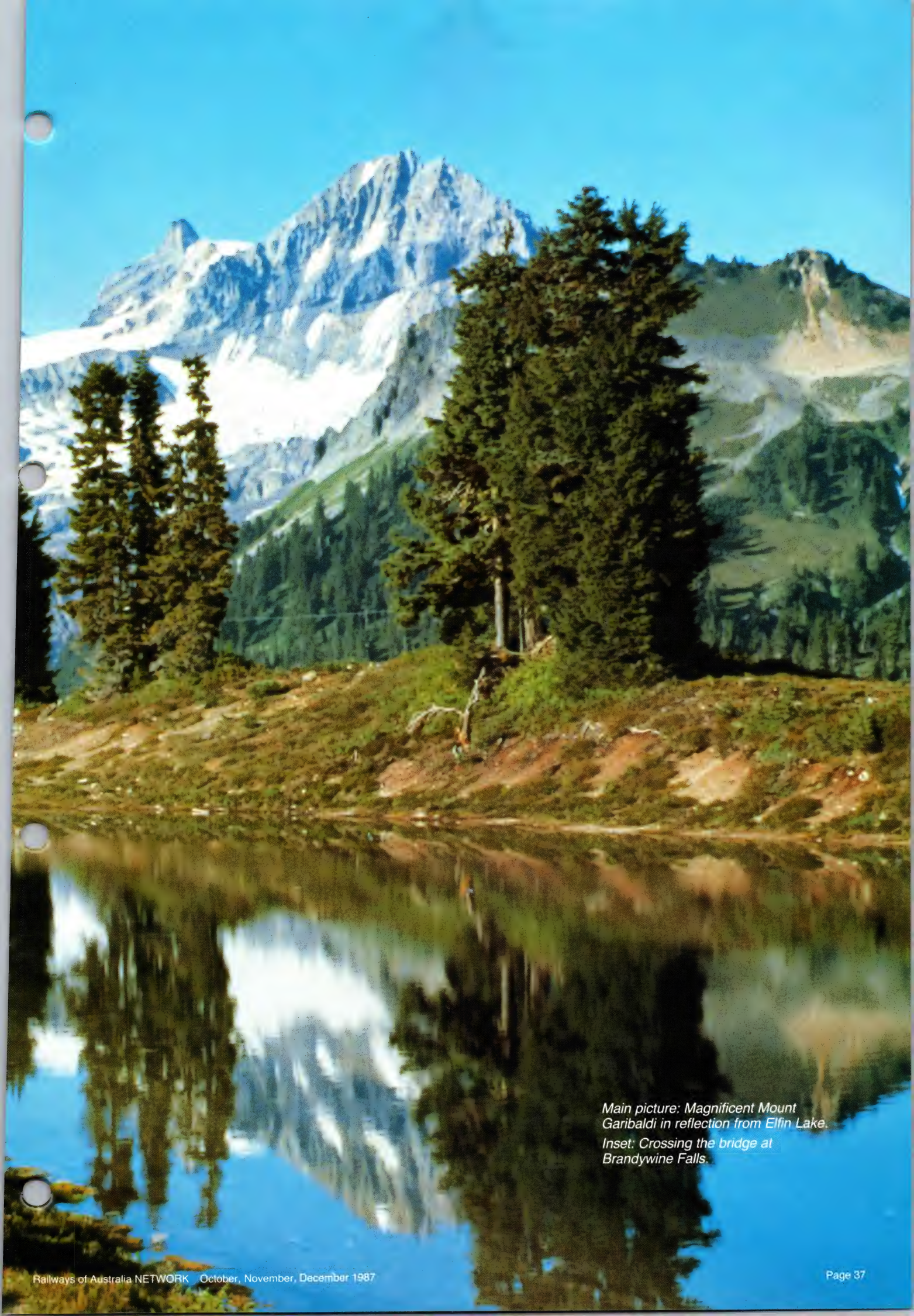
This valley region along the Lillooet River was the main transportation route to Cariboo country during the gold rush days of the 1860s.

At any point along the right-of-way, the train makes flag stops, including the Indian reserve of Mt. Currie, disbursing mail, foodstuffs and medical supplies to inhabitants.

BC Rail is their lifeline, especially in winter.

Nearby Birkenhead River, home to Chinook and Coho salmon, steelhead and rainbow trout, is one of the finest fishing grounds of British Columbia.

Six car Cariboo Dayliner prepares to depart Lillooet.



Main picture: Magnificent Mount Garibaldi in reflection from Elfin Lake.

Inset: Crossing the bridge at Brandywine Falls.

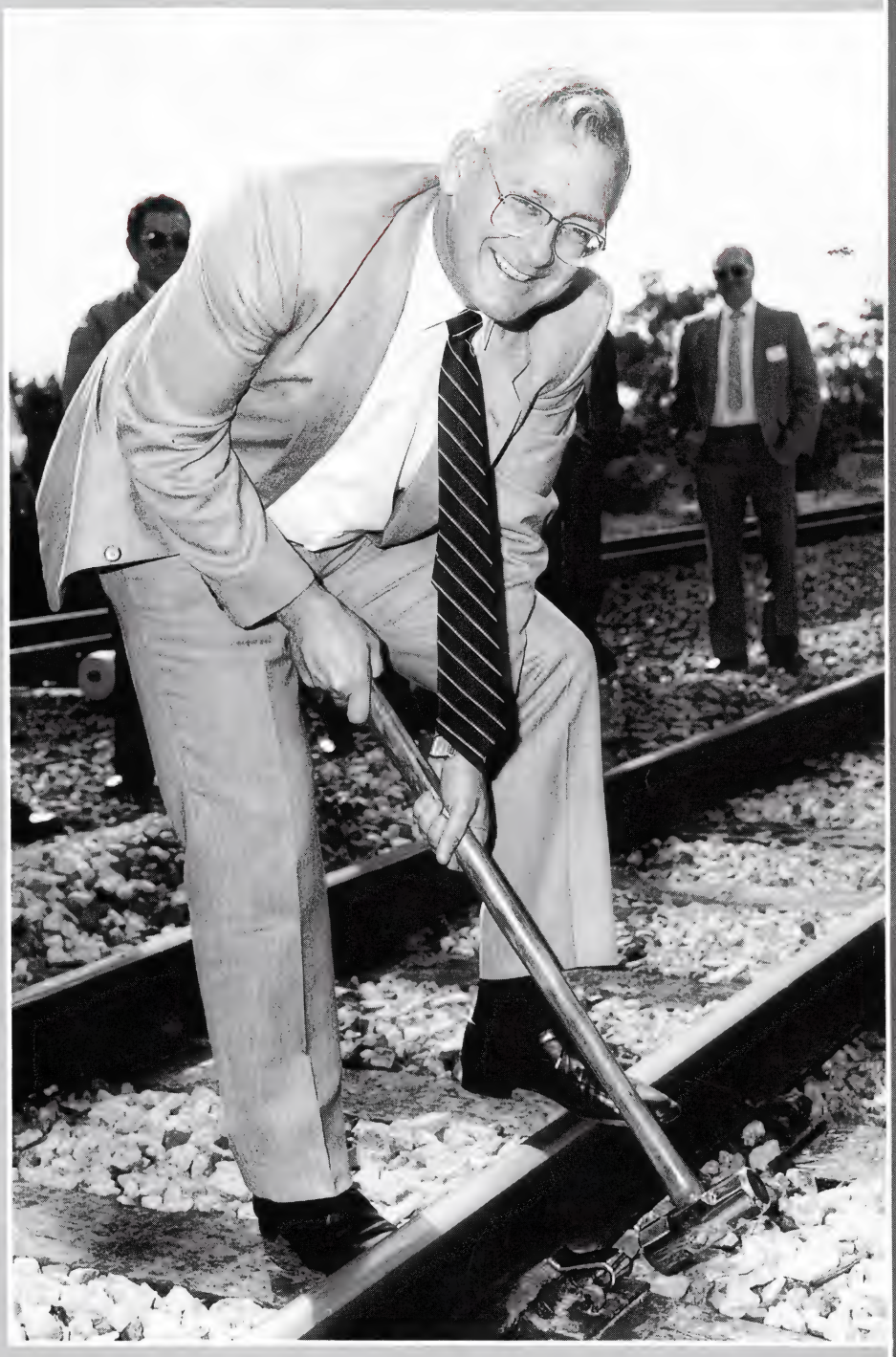
From mile posts 139-157 the train runs along Seton Portage, site of the first railway in Western Canada (a three-mile narrow gauge line built in 1861), Anderson and Seton Lakes; the latter famous for its unique milky blue-green colour — a reflection of glacial till.
At 12.35 p.m., the train reaches Lillooet, a major division point of BC Rail, for a half-hour stop.
On first sight, the community doesn't seem to offer much, especially to the tourist; closer inspection reveals a rich history.
Originally called Cayoos Flats, it is located at the junction of Cayoosh Creek and the awesome Fraser River.
In 1858, during the Old Cariboo Gold Rush it was the main waystation to the gold fields at Barkerville and Wells and known as "Mile One."
In 1863, Lillooet had a population of 15,000, the second largest town north of San Francisco, boasting 40 liquor stores!
In 1886, with the completion of Canada's first transcontinental railroad, out-of-work Chinese labourers invaded the area in search of gold.
Surviving numerous "booms" and "busts," the multiracial prospectors and fortune hunters settled the region making it, today, the centre of the fertile valley best known for its fruit and vegetable harvests.
At 1.00 p.m., with a change of crew the train glided slowly out of the newly built station.
Crossing the mighty Fraser River, the dayliner began its climb up a 2.2 percent grade hugging the mountainside of the river canyon to the 3,000 foot Cariboo Plateau.
Traversing this sector under intense blue skies and brilliant sunshine, the entire landscape offers photographers great opportunities to capture endless panoramic sights.
Kelly Lake (mile post 192) signals our entrance into Cariboo country amidst rolling hills, rich grazing land and alkali lakes.
Stopping at Clinton, we are told it is well known for its annual rodeo and Clinton Ball — often host to royalty and world statesmen.
A few miles up the line, a flag stop at Flying U signals we are in the heart of British Columbia's popular guest ranch country.
Highest elevation on the rail line is Horse Lake at 3,864 feet, site of the old water tower "Lone Butte" used in the days of steam-powered locomotives.

The Cheekeye River seen from the Cariboo Dayliner.

Most famous ranches are: Exeter named after the Marquess of Exeter; 108 Ranch/100-mile house area is a cross-country skier's paradise in winter; and Lac La Hache (called by Indians "lake of pretty waters"), a lovely resort with excellent seasonal ice fishing.
From Kelly Lake to Williams Lake, the dayliner traversed 125 miles through Cariboo country.
No wild life was seen.
We were able, however, to admire the diversity of landscape, its natural beauty and foliage in full bloom, a constant reminder of British Columbia's great natural heritage.
BC Rail's hallmark is the very-popular dogwood, the symbol displayed on its literature and logo on its rolling stock.
The last leg of our rail saga is the run from mile posts 315-462 — Williams Lake to Prince George.
At 6.47 p.m. we arrived in Quesnel. In 1805, it was a bustling frontier town established by the Hudson's Bay Company.
Simon Fraser an explorer stopped there in 1808 and obtained furs and fish from the local Indians.
Today, there are 150 pulp and sawmills operating in the vicinity and is the centre of British Columbia's forest industry.
During the final two hours aboard the "Cariboo Dayliner," I enjoyed a fine dinner graciously served by the train's hostess.
An agreeable choice of entrees is available at all three meals: breakfast — hotcakes and bacon; lunch — baked chicken; dinner — steak and kidney pie topped off with tasty desserts and hot coffee.
Arriving on time at BC Rail's Prince George terminal gives the first-time visitor the impression they had arrived "in the boonies."
However, once aboard the city motorcoach, we were whisked with fine despatch to the heart of the city boasting a population of 75,000 persons.
This is the commercial and transportation centre of Northern Central British Columbia.
It is a modern city with an excellent selection of hotels, motorlodges and restaurants, all moderately priced.
Having visited Prince George on prior occasions, I can without hesitation endorse the claim of the local chamber of commerce that it is one of Canada's finest tourist areas.
Unprecendented growth of the 1960s by the local lumber industry has not spoiled the city or environs.
Visitors will be particularly impressed with the city's cleanliness and the friendliness of its citizens.
Prince George can be reached by air, rail or highway.
However, my choice is BC Rail's "Cariboo Dayliner." Run right down to your nearby travel agent and make your reservation — you won't be disappointed.

Westrail re-builds a billion dollar line

A $23 million project to rebuild WA's most important railway line was officially completed recently.
The Minister for Transport, Gavan Troy, hammered in a gold-plated rail fastener at Picton near Bunbury to end the six-year project which began at Kwinana in September 1981.
The Kwinana-Picton railway, 159 km long, serves the alumina, bauxite, coal and other industries of the South West and carried commodities valued at one billion dollars a year.
The line also carried the Australind train between Mundijong and Picton.
Mr Troy said the upgraded railway was a key element in the government's South West initiatives, which included the Bunbury 2,000 programme.
"Kwinana-Picton is the most heavily used part of the Westrail network and is the backbone of key export industries," Mr Troy said.
"The ports of Bunbury and Kwinana rely on the ability of Westrail to provide highly engineered track because large quantities of export commodities must be moved quickly and economically."
"Westrail clients such as Alcoa, Worsley Alumina and WA Chip and Pulp are already benefiting from this project."



Minister for Transport Mr Gavan Troy hammering in symbolic last rail clip at Picton Upgrading completion ceremony.

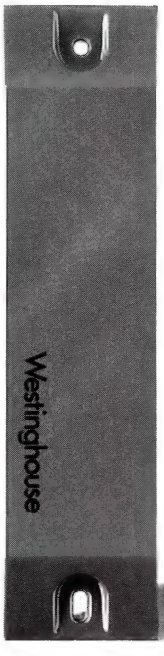
The Kwinana-Picton project involved the complete construction of the existing railway line, which was rapidly being worn out by heavy freight trains.
Working at 2.25km each week, a team of 60 railway construction staff removed old rail, sleepers and ballast.
They then reshaped the bed of the track, laid new ballast, sleepers and rail and tamped the track into its final position.
Each 110 metre length of new, heavier rail installed was field-welded to the next to create two virtually continuous strips of steel.
All track work had to take place in an operational "window" of about four hours a day so that train services were not disrupted.
The rebuilt line follows the exact course of the existing line except for a small diversion at Yarloop.
Although the Kwinana-Picton project will mainly benefit freight trains, passengers on the new Australind will enjoy a smooth, faster ride because of the high quality of the new track.

If you are involved in the movement of thousands of wagons each week, you need to know where they all are–now! SHADOW from Westinghouse Systems can tell you. SHADOW is a new Electronic Identification System (E.I.S) that performs in snow, rain, fog, darkness, dirt and high vibration environments. SHADOW can read the 128 bits of user encoded data in each vehicle tag, over distances of up to 40 metres, with 100% accuracy. All of this while the tagged vehicle speeds past at up to 200kph.

Teamed with an appropriate computer database the SHADOW System can: locate a vehicle, time its arrival, define a train consist ..... In fact, it can answer all of these difficult tracking questions which plague your present operation.

FOR FURTHER INFORMATION ON HOW SHADOW CAN HELP SOLVE YOUR LOCATION PROBLEMS FAX, PHONE OR WRITE TO:

David Aylward at:



'THE SHADOW' –see's all!

HAWKER SIDDELEY

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Anniversary for Westrail Coach Service

Westrail's railway bus has turned 40.
The country road coach service, which had a humble beginning in 1947, has celebrated its 40th anniversary and to mark the occasion more than 100 present-day and retired railway bus drivers and conductors gathered at the Westrail Centre to celebrate the occasion. The service has carried 10 million people and travelled more than 105 million kilometres.
On display at the celebration were two of the original fleet of coaches from the 1940s together with a display of old bus stands and signs, and a pictorial history. A scroll containing the names of all drivers and conductors employed during the last 40 years was on display, and drivers dressed in 1940s and 50s uniforms.
The Minister for Transport Gavan Troy said Westrail's four decades of good service to WA and recent dramatic improvement in performance would put it in better stead in the light of the proposed deregulation of country passenger services.
The railway road service began in 1947 with 28 coaches.
The routes they operated on were Bunbury to Northcliffe, Boyup Brook and Flinders Bay, Perth to Hyden via Boddington and Narrogin, and Perth to Albury via Kojonup.
Because of post-war restrictions the first buses were all built on truck chassis.
Most carried manufacturers' names that have disappeared — AEC, Dennis, Lancet, Bedford, Landliner.
In their first year the buses travelled a total of 555,000 km.
During the following four decades the road fleet expanded to a peak of 57 in 1964 and the number of routes grew to 28.
The quality of the buses also improved dramatically.
Air conditioning was introduced in 1978 and the present fleet is all Mercedes Benz five-star with air bag suspension, air conditioning, reclining seats, and toilets.
While the total distance travelled annually has risen to almost two and a half million kilometres, Westrail has greatly improved the efficiency of coach operations, so that the number of coaches has actually been reduced to just 28 again.
Road Services Manager Ernie Holmes said Westrail had a safety and performance record second to none in Australia.
"We have established the Westrail road coach as a vital part of country life throughout the southern half of WA," he said.
"We are looking forward to continuing this role for another 40 years, and more."

From the left: retired drivers Bob Lloyd & Frank Kelly, current Road Services Officer Arthur Bennison, President of the Bus Museum of WA Terry Duke, and retired driver Ray Smith. The bus is an original Dennis Railway bus of 1947, now on display in the Bus Museum of W.A.

VFT Project a pi p

From a Special Correspondent

The Very Fast Train (VFT) Project is no longer a pipe dream of three academics at the CSIRO.

There's a very real prospect indeed that VFT will be running through by 1995.

Just two years ago, knowledgeable people in the railway industry had reluctantly conceded technical feasibility but, propping up the bar in the Ansett Terminal, gave the project only around ten percent chance of success.

Today the scene is in the Golden Wing Club and odds as high as 80% are being quoted by the same people.

The more forward-thinking speculators and entrepreneurs outside the project are already trying to figure how they can best position themselves to piggyback onto VFT success and pumping those in the know.

That situation has grown from the results of a well-conceived and very professionally-run pre-feasibility study that was widely believed to have cost $1.5m.

In fact, however, the pre-feasibility study rather resembles an iceberg.

At the top of the iceberg are the visible few public-reported results, embodied in the decision of the three original promoters (TNT, Elders and Kumagai) to proceed to a more detailed $A3m study that will clinch the decision to spend $4.0 billion and the recent (August 1987) decision of the Big Australian to join the VFT project.

Below the iceberg and much less visible, lies a mass of unpublished and very "company-confidential" results of the initial analysis, which were done by a wide spectrum of specialist Australian company advisers in the role of "consultants" to VFT.

Many of these are not true consultants but manufacturing firms who have in fact done work and have reported it to VFT, in far more detail than the term "pre-feasibility" study would suggest.

Some in fact have done work that more closely amounts to the costing and design associated with a tendering process.

It's therefore appropriate and timely, given the importance of VFT success to the future of passenger rail in this country, that **Network** takes stock of this project, the forces working to make VFT happen, and the scale of its potential impact.

The Concept

The VFT concept calls for an 876 km double-track, ultra-high-speed 350 km/h all-electric railway from Sydney to Melbourne.

The stated goal is to run from Sydney to Canberra in roundly an hour and to Melbourne in a shade over three.

The plan is likely to include a convenient Sydney Kingsford Smith Airport connection, thence via the new direct southern line (East Hills/Glenfield) to Campbelltown and a new, more freeway than railway, alignment to Goulburn with an SRA-NSW XPT interconnection for the Riverina and Albury-Wodonga (cutting the rail travel time, incidentally, by almost 2 hours).

The line then goes more or less directly south-west to Canberra and south to Cooma.

From the snowfields connection, VFT runs via Bombala and Delegate, and through a trans-alpine tunnel some four kilometres long, after which it drops to the Gippsland coast of Victoria with access to Western Gippsland, the Latrobe Valley and a final run, again more or less via the freeway, into Melbourne.

'Feasibility study supports the scheme'

When John Whitton took his original Great Southern Railway up through the Highlands in 1870 he built steep and straight — 1 in 30 and whenever possible long runs of tangent track, sandstone cuttings notwithstanding.

VFT will be a shade steeper at 1 in 29, a lot straighter with a minimum curve radius of seven kilometres and inevitably more profuse in its rockwork.

The standard gauge (1435 mm) VFT line will be cross-connected only to State Rail (it cannot be connected to V/Line's Gippsland routes because of their 1600 mm gauge) probably at Campbelltown, Goulburn, Canberra and Cooma alone.

The latter two are branch lines and would seem only marginally relevant once VFT construction is complete.

VFT will be electrified at 25 kVac and reserved for use by fixed-formation trains alone, both passenger and priority freight.

Conventional loco-drawn traffic is definitely not envisaged, although the option of at least interim XPT operation on some sections has not (the author understands) been totally ruled out.

Readers may think it a quaint notion the nimble 160 km/h XPT could get in the way of other traffic, but VFT is to XPT as XPT is to a wheat train — and line occupation by slower traffic is a critical factor on fast lines.

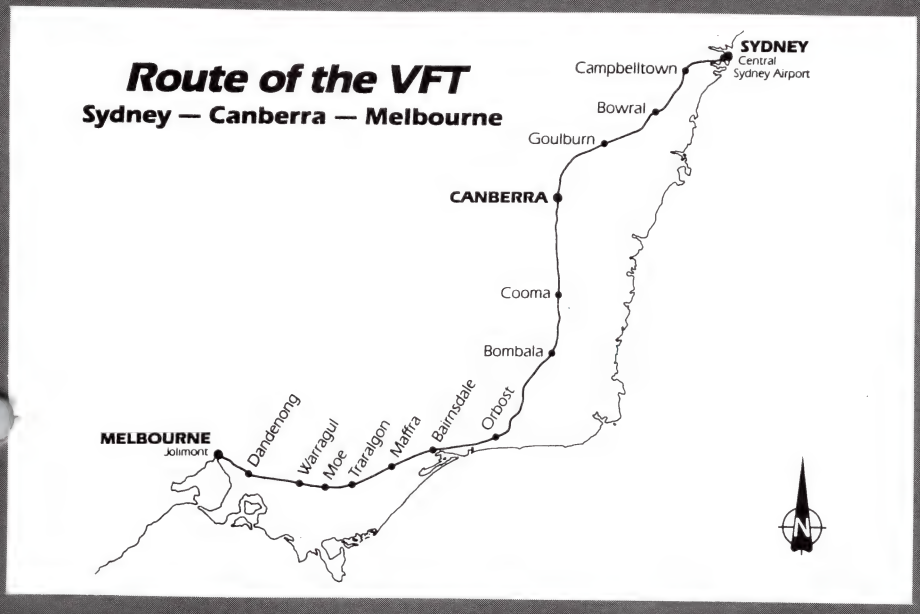
Two operating issues are certain.

VFT will not follow the XPT precept of regular or conditional stops in every country Shire; time is money and stopping a 350 km/h VFT would cost at least 10 minutes and probably, hundreds of dollars — quite apart from rendering the mainstream intercity service just that little bit less attractive, and less commercially relevant.

Boeings do not serve the Latrobe Valley or Goulburn, and a Sydney/Canberra/Melbourne stop pattern is likely to be the norm for business expresses with Cooma a possible in the winter sports season and maybe, just maybe, a pickup/setdown at the edge of the 160-200 km/h suburban sections.

The VFT company may be forced under 1500 Vdc wires by the need for

e dream no more?



a final shared-track entry into Sydney and thus for a TGV-like dual voltage electrical system.

With modern 3-phase asynchronous-motor electrics, the 1500 Vdc option is not all that expensive to add to the train.

But there is no way VFT could be sucked into a TGV-like extension of service beyond its own track, to catchment areas under SRA-NSW wires, eg. to Newcastle or Wollongong.

These route alignments are simply too slow and the extra revenue potential too low.

A 350 km round-trip extension Sydney-Newcastle (for example) would end up costing more time than a one-way trip to Melbourne, with comparative revenues of around $45 versus $105 per seat.

Indeed it is only when a highly-productive passenger train like VFT comes on the scene that one realises just how much we are really paying for our slow, antique route alignments, stops of convenience, and below-cost fares.

The 350 km/h VFT route will be a tough one — the toughest of any of the world's high speed lines.

The 250 km/h Japanese **Shinkansen** lines are gently graded, and tunnel through the hills.

So do the 250 km/h **New Lines** of West Germany, designed for mixed passenger and goods use, and the 300 km/h (design) **Direttissima** of Italy.

The French **TGV South East** is built "up and over," and its 1 in 29 grades give the passengers an exciting 220/260 km/h rollercoaster ride over a route that is essentially a steel freeway.

In contrast, the VFT will at 350 km/h be nearly 100 km/h faster (and the top 100 km/h is the hyper-hardest).

Trains will face a long, hard pull — if not over the roof of Australia, then at least through the attic window.

When coupled with the electric braking needed to bring VFT down the mountain, the duty cycle on the electrical gear will be in the high-speed electric arena, every bit as tough as Hamersley Iron's duty cycle is to heavy-haul diesel locos.

Yet there are very few technical unknown in VFT.

Achieving bogie stability at 350 km/h is ambitious, but achievable; current collection the same; traction and braking likewise.

The only problem that hasn't yet been publicly addressed is that of aerodynamic pulses (pressure waves) in the transalpine summit tunnel.

A very large-bore German-style tunnel would be needed, or the signalling system would need to be arranged to prevent two trains passing in tunnel, or separate bores with careful tapered entrances would be required.

Painful pressure changes on the ears are quite a problem at only 200 km/h on the heavily-tunnelled double-deck Italian **Direttissima,** where conventional-size bores have been built and it is too late to change.

Fully-pressurised coaches would seem an overkill.

No detailed construction timetable for VFT has yet been published.

But the nature of the traffic patterns means that the whole line will have to be complete before an economic rate of return can be obtained on any one section.

The Sydney/Canberra/Cooma section, for example, would not be viable in isolation.

The time-critical sections are most likely to be the summit section including the tunnel under the range and the city access sections, particularly into Melbourne where a new alignment clear of existing railways is involved.

The first section to be completed, on which test running is likely to be undertaken, is being widely tipped as Canberra-Goulburn and the interim diversion of the Canberra XPT onto this has also been pondered.

Such a move would cut XPT's present roundabout 1½ hour branchline run by more than one-half, to about 40 minutes — and by almost two-thirds, to around 25 minutes with VFT equipment!

For such a ride, who would carp at changing trains in Goulburn?

> 'Huge potential impact to corridor'

Why No Government VFT?

People who have grown up in a country that had the first Government railway in the world (NSW, 1855) and the first statutory corporation (the former Victorian Railways over a century ago) equate passenger rail with Government rail and passenger losses.

They ask — very logically — how VFT, with its price tag of $4.0 billion, could possibly be made to pay and how any private-sector investors could possibly see a dollar in it.

They note that in all four overseas countries with existing high-speed rail lines, the systems are Government-owned — even Japan's hasn't been sold off yet — and that the French TGV South-East carries roundly ten times as many passengers annually as **all** transport modes in the Sydney/Melbourne corridor.

And finally, they note that when former Commonwealth Transport Minister Peter Morris put the question, the Bureau of Transport Economics said VFT wouldn't pay.

BTE was right — and not for arguable reasons of a Government enterprise's "inefficiency" versus the private-sector's "efficiency."

The Australian Airlines versus Ansett debate is irrelevant; the fundamental reasons why Government wouldn't want to build and run VFT lie in the way that economic beans are counted in the Commonwealth (and other) governments, as against the commercial opportunities available to private investors but denied to Governments.

The negatives to Government operation lie in two areas.

First, the approved way for conducting an economic analysis in the Commonwealth (and most other) Governments is to calculate the annual cash flow — i.e. costs and benefits — over 15 to 20 years.

These are discounted at an agreed rate of 8, 10 or 12 percent (which is not an interest rate as such, but more a reflection of alternative opportunities foregone) to produce a "net present value" for the investment and a "benefit/cost ratio" that should exceed 1.0.

Under this system, short-term payoffs discount to a higher present value, and long-term benefits have little impact.

Under this formula, a project with a long construction time (i.e. extensive negative cash flows in the early years) has to have a near-phenomenal payback rate in the later years.

> '876 km of double track is proposed'

With no major revenue payback until the line goes right through, VFT has no hope of surmounting the Department of Finance's approved economic analysis technique.

Leaving aside the ability of the skilled analyst to cheat, and fudge the figures to suit the answer that he may think his public service boss wants to see, the analysis technique can even create some major distortions to new infrastructure.

On the federally-funded Hume Highway reconstruction, there will be no more long, completely new sections like the famous Mittagong-Campbelltown stretch.

No matter how good the road may be, a long section takes too long to build and you can't get the benefit cost ratio right.

Better to take the soft option of incremental improvement to what's already there.

Finally in respect of capital, an Australian government would have to raise it at our bond rate — currently over 12%. No project like this can carry debt charges like that!

How Come a Private VFT?

The case for a private VFT is not the reverse of the non-case for a Government line, but a totally different ball game in the world of business, which is quite different from that of the Bureau of Transport Economics.

It is worthwhile looking at the VFT group — who are they, and what they bring to the project.

Led by Sir Peter Abeles, TNT is Australia's biggest private transport enterprise; together with Mr Rupert Murdoch's News Ltd, TNT owns Ansett — not just the airline, but a related transport empire in its own right.

Elders (Mr John Elliott) is Australia's No. 2 company, chasing BHP (No. 1) which only recently joined the VFT group **after** its consulting and project engineering subsidiary had been directly involved in pre-feasibility study work.

Kumagai is a major Japanese development and construction company.

These people comprise, collectively, some of the most astute businessmen in Australia (and Japan) today.

All have the common objective of making an honest after-tax dollar and no doubt all have different individual corporate motives.

The forces they doubtless perceive working for them, and for VFT, include at **least** the following:

- "Cheap" equity money from Japan.
- Broadly-based transport expertise.
- Commercial approach to revenue-raising.
- Very high productivity on the VFT rails.
- Fringe investment and major capital gains near them.
- The Australian taxation system.

It is interesting to note that for a variety of reasons, virtually all of these positive forces are **denied** to a conventionally structured Australian government railway.

Let's check them out.

Equity Investment. First, a Japanese equity investor in a VFT company does not expect to receive the Australian Treasury bond rate of 12% for (say) 15 years and to be paid back in depreciated currency.

He is prepared to accept much lower rates of return in the expectation of real security and growth from an internationally-diversified investment portfolio.

The Japanese investor's domestic interest rate is around 6%, not our 12% bond rate and our 16% bank rate for companies.

And Japan is literally awash with investment capital looking for some sound place to go.

For the "right" equity opportunities, Japanese investors will accept initial annual dividends as low as 2-3% and **that is around the "cost" of the money that built the great**

company railways of England and the USA in the last century.
Government bonds simply can't match the attractiveness of this.
TNT and Ansett. Secondly, there is TNT.
Few Australians realise how extensive, diverse, multi-modal, integrated, international and utterly professional this company is — the company that grew from Ken Thomas' small truckline, over 30 years ago.
There are two major sides to TNT: Ansett, which is primarily but not exclusively people-based business, and TNT itself, which is primarily freight based.
Ansett, jointly owned by TNT and News Ltd, is of course a household name as a line-haul airline.
Its separate roots trace back to ANA, the old Holyman interests and Sir Charles Kingsford Smith's original ANA of the Depression years; to the late Reg Ansett and his limousine then airborne challenge to Sir Harold Clapp's Victorian Railways; to MacRobertson Miller in WA; and so on.
Also well known are the Ansett group's regional airlines in the various states.
Lesser-known are Ansett's widespread network of commuter feeders, its dependent associates, its rising international aspirations via NZ and the SW Pacific, and its other diverse holdings in aviation support.
Ansett is strong but not dominant in airfreight and has the valuable connection of preferred through-bookings from QANTAS.
Its other businesses include road freight, couriers, seats and vehicle building, furniture removal, energy, the Pioneer, Grayline and Trailways coach networks, tourism, hotels, and commercial catering.
TNT, Sir Peter Abeles' company, had its grass roots in trucking and the consolidation and forwarding of freight, in which it is today nationally pre-eminent.
As such it is of course a major customer of the railways — and for door-to-door containerised service, a competitor as well. TNT owns Rudders.
Its business includes ships, insurance, customs clearance, two courier services, materials handling, the security business (armoured cars, people, alarm services equipment).
Its stature is international and it has a wide portfolio of businesses within its Australian skills, in Europe and North America.
Given the ability of VFT to complement and support so many of these businesses — and conversely, the threat that a VFT in competitive hands would pose to them — is it really a matter of surprise that the TNT group is a vitally interested VFT partner?
Surely TNT would be exceptionally inept were it not in — for VFT will have major impacts in the passenger travel, priority freight and courier businesses that are the grass roots of TNT and Ansett.

Commercial Fares. Third, there is the financial strength of the consistently commercial approach that only a private sector group can bring to fare structures and thus revenue.
For many years, even full fares have not been sufficiently high to recover the cost of operating passenger trains on Australia's government rail systems.
Despite this, or perhaps because of it, generous discounts have been offered by Governments and the revenue foregone by the railway has been made up by State Treasuries as subsidised losses.
The scale of these is very high.
A few years ago Mr Brian Grey (the then Managing Director of East-West Airlines, and interestingly himself a former Ansett executive) made a widely subsidised offer to fly all the country train users in NSW in return for being given the subsidy.
There are major differences in the public's attitude to inter-city transport fare-setting, wherein the railway (i.e. the Government) is expected to be subsidised and cheap and tends to move down-market (but not as far down as the unsubsidised buses) while the airlines consciously endeavour to move fares and passengers, as far up the market in all its diverse sub-sectors, will bear.
A classic recent instance of this on the VFT corridor is the Air NSW F27 service, instituted by the Ansett group as "standard" class at a $67 fare Sydney-Canberra, to compete with East-West Airlines (who originally developed the route, and which Ansett has since bought out).
In the last few months, however, there has been a full "Economy Class" service available on the F27, achieved by loading the $67 standard class passengers backwards from Row 1 at front of the aircraft, while those unwise enough to pay a $95 full Economy Class fare (to enjoy absolutely identical accommodation and Ansett's excellent cabin service) are loaded from Row 10 forwards!
Regulars in the know pay their $67, nominate a seat around Row 7, and usually enjoy an empty place beside them.
No Government railway would dare to try such a ploy, but as an airline practice, it is an accepted marketing and revenue-maximisation gambit.
The current fare situation on the Sydney/Canberra/Melbourne corridor is also interesting in the context of VFT's target markets and intended fare relativities. The service available, and one-way fares are (Sydney/Canberra) see table:
The market straddle that VFT will catch is formidable — from First Class jet (because of VFT's immunity from fog at Canberra, congestion at Sydney and its downtown city terminal) through to a significant proportion of bus users who are likely to value three hours of their time at more than $20. The French certainly do!
A recent busline collapse notwithstanding, all modes are profitable on the above fares, except alas for the present railway.

Ansett or Australian Airlines Jet (B727, B737)	First $143 Economy $95	25 min flight, plus Sydney Airport delays
Air NSW or East-West (Propjet F27) VFT Proposed	Economy $95 Standard $67 One-class $35	45 min flight, fewer delays at Sydney
State Rail XPT	First $32.60 Economy $23 APEX $15	4 hrs (approx)
Coach (several buslines)	Normal $15 Pensioner $12	4 hrs approx includes snack

Earlier attempts to charge a premium fare for XPT failed, because the market is clearly time-sensitive and only at the current fares are the trains well-filled.
But not, regrettably, with either a predominance of either full-fare passengers (very large numbers of half fare concessions are carried at less than the bus fare, in greater comfort) or with business travellers.
The exception is from intermediate destinations where "country" rather than "inter-city" ground rules apply and there is no bus or air alternative.
The above experience is typical of virtually all Australian intercity trains save those genuine "hotel trains" marketed as a tourism experience (including overseas marketing via QANTAS and the travel industry).
Australian railway fare-setting is in direct contrast with the approach to the pricing of rail fares in (say) the UK where, even since Edwardian company railway days when just four First Class fares bought all the coal for the Flying Scotsman's run and paid the crew, the high level of ordinary rail fares has never failed to shock the Australian visitor.
We can assume that for commercial survival, VFT's fare policy will be more airline than traditional Australian railway in character, that Apex and standby fares will be offered solely on the basis of a commercial judgement of marginal extra revenue and that if people are to ride VFT at concessional fares as a matter of public policy, it is the traveller and not the VFT company who will be subsidised.

Productivity

Productivity and work practices are contentious issues on Australian railways.
Value judgements and preconditioned attitudes abound in the debate on productivity, so that it is not always well-informed.
However, a number of issues are not in dispute.
In industrialised countries overseas, the very few government run passenger trains that do operate profitably have three key characteristics, which are essential elements for commercial success.
The trains are chair-coach trains, not sleepers; they run point-to-point service, not classic country trips with tapering-off loads; and they run fast.
This attracts revenue and on a passenger-km basis, reduces the labour cost and fixed charges on rolling stock.
The most successful overseas intercity trains rarely exceed VFT's 4 hr trip time, and turn around fast; they can make several round-trips daily.
They do this because they operate on well-aligned routes over tracks fettled up and signalled for high speed, with sustained cruising speeds of 160-260 km/h.
Contrast this with the Australian situation (last Network, page 44) where XPT is able to cruise at its full 160 km/h capability only for short distances.
Such is the price of trying to make silken speedways from the sow's ear alignments of the last century's colonial development railways.
Even the best-fettled track is no faster than its curves.
Consider the difference between an XPT running a ten-hour service Sydney/Melbourne, and a VFT making the round trip in just over three hours.
The XPT can make only a single one-way trip daily — two only if it returns by operating a down-market chair coach night train.

> 'Few technical unknowns for Australia'

The VFT can make two round trips plus a short round trip Sydney-Canberra, all at up-market travelling times.
At a $105 through fare, its revenue potential is nearly $500 per seat per day while XPT's maximum potential (on government rail fares) is only $138 for an economy, or $188 for a first class seat. For the dominant market the VFT revenue benefit is almost threefold.
The VFT can be comfortably worked by one crew per round-trip; the XPT will need typically four (six in the case of drivers).
The VFT will probably cost more per seat than XPT, but not over 15 percent more.
The electric VFT with its solid state equipment and brushless traction motors, will also cost much less to maintain than the diesel electric XPT, and run further between works overhauls (but its wheel maintenance is critical, and likely to be dearer than XPT).
In all revenue and cost aspects VFT has to be as far ahead as a jet is ahead of a DC6.
Additionally, a new and privately operated system has the advantage of not inheriting the institutional problems of an industry that by 1995, will be 140 years old.
VFT will also be able to afford and pay for, the very best calibre of staff at all levels.
All these add up to a productivity potential matched by no existing Australian passenger rail operation and probably, no existing high speed rail operation overseas.

Real Property Implications

The time savings of VFT, its affordable fare structures and its sheer convenience will mean a major reordering of travel patterns in SE Australia, generate new discretionary travel and bring large numbers of people to VFT stations.
This will have an enormous influence on the development potential and property values of the areas concerned.
The nearest direct parallel is the growth immediately around an airport

'A major competitor with hig

complex, but VFT will have an impact greater than this through significantly reordering the relevance of towns and regions it services.
It is not difficult, for example, to imagine complete VFT/ring road/suburban rail interchange complexes developing at places like (say) MacArthur just south of Campbelltown, NSW or Pakenham (beyond Dandenong), Victoria.
To this must be added city redevelopment.
Suppose, for example, VFT terminated in a suburban rail-served redevelopment of an area like Erskineville, or Redfern, or a redeveloped Jolimont Yard in Melbourne?
Would not the whole nature of the area and its values change?
To this must be added Canberra, which becomes a dormitory suburb of Sydney for wealthy up-market commuters and (at long last) a credible decentralised manufacturing centre, the rich snowfields market at Cooma — or possibly some New Cooma — and whatever centre becomes the VFT-head for the Latrobe Valley in Victoria.
The Japanese Kumagai Group is a leading international construction firm and property developer and well attuned to the implications of fringe development near VFT.
No doubt the other promoters are equally well-briefed.
The implications are such that associated urban development could well exceed the railway construction itself in scale, values and paybacks.

Taxation Issues

The author is not a corporate structuring and taxation expert, but people who are, have outlined some of the scope that a project like VFT has, compared with the classic concept of a passenger railway aimed and run by the Government.
First, there is the tax benefit to be gained from land on long-term lease instead of purchase; the lease charges represent a deductible cost (not capital locked up).
The asset can be written down i.e. depreciated for tax purposes at a faster rate than its physical deterioration through age; this leaves an asset that is fully operational and maintained producing cash, for a lower net capital investment.
Other tax advantages can be obtained from a wide variety of corporate structures.
All these are normal practice in business and all result in a greater after-tax return to the stockholders.
And in the ultimate, the tax man will still benefit from taxing the extra economic activity.

Technology

What of the technology? How much of VFT will be Australian?
In planning and designing the route our engineering consultants have little to learn and virtually nothing need be sought overseas.
Such bridges as are needed and the summit tunnel under the mountains, are well within our skills.
The same applies to the track.
The rail track skills learned in the Pilbara heavy-haul iron ore systems are totally transferable to VFT and a heavy-duty track structure of all-welded 60 kg/m rails on Australian-developed concrete or steel sleepers with Australian developed elastic fastenings will handle anything that VFT can impose on its track.
We have the ability to design and build ultra-high speed turnouts (points), and wholly Australian tracklaying and track maintenance skills can provide all that is needed.
Concerning the electrification system, 25kVac overhead will be needed and, as some sections of the line traverse country where the power grid is physically sparse or not electrically "stiff" extensive use of transmission at 50kV via the (25-0-25kV) autotransformer system is likely.
We are already amongst the world's most experienced users of this system from the Queensland Railways main line electrifications and our electrical engineers need neither foreign advice on this, nor foreign suppliers.
The signalling of this line will call for continuous and jointless track circuits — on a 350 km/h line with icy winter temperatures, broken rail protection is a "must" — and an automatic train control/cab signalling feature that functionally, matches the French TGV or Japanese Shinkansen capability.
No existing Australian developed system matches this, but of three local signal manufacturers, at least one has access to a fundamentally relevant system now and the other two could gain access to a proven system under license from Japan, France, Italy or Germany, to manufacture it here.
But there is no reason why, given three years' lead time, the Australian electronics industry and CSIRO could not develop a new, all-Australian system which would be far more exportable than copycat technology.
In CSIRO's early proposals for VFT, there was talk of a remote-controlled "drone" operating ahead of the train to prove and report back the safety of an unobstructed track.
For 350 km/h operation the idea has some attractions, although for stability reasons the drone would need to be at least the equivalent of a sled-like motorised flatcar and as a platform alone it would probably cost $1.5m.
The real problem, however, is that the drone would absorb line capacity through needing to precede the "real" VFT by about 10 km.

'Australian technology can match challenge of task'

h volume air traffic operators'

And even then it would still leave the determined intruder and saboteur — the greatest threatener of safety on a line like this — enough time to do his worst.

Turning to the trains themselves, which would undoubtedly be built here.

Readers may be surprised to learn that initially the only aspects that could not be done here in Australia, right now, with locally developed technology concern the electric traction package, the drive to the wheels and some aspects of the bogie.

For a train of this type with 4 MW power cars, brushless 3-phase traction motors would be preferable (but not mandatory) and they would need to be body mounted to minimise bogie masses and achieve stable riding.

Both the French TGV and the German ICE have technologies that are prima facie, suitable.

But once again, all the skills for reinventing a drive that we can export on our own terms exist here.

Concerning the bogie itself, there are dynamic modelling skills of a very high order already in place in at least one carbuilder's design team and that firm is keen to develop a 350 km/h bogie.

Your author believes that a critical review of this technical team's capabilities by independent professionals is likely to confirm his own judgement that Australians are competent to produce a sound VFT bogie by 1995.

Australians are notorious for the technical cringe, just as much as the cultural variety, and the author thoroughly endorses the CSIRO view that VFT should be used as a catalyst to advancing our own railway technology rather than copying others.

Everything else on the train — brakes, pantographs, car structure, interiors, aerodynamics (important because of that tunnel), car air-conditioning, electronics, on-board diagnostic computing, communications of all kinds, all these things — we can already do in 1987.

Post-Pilbara we have little to learn in the management, maintenance and systems engineering technologies, and (via Ansett with its aviation industry connection) very little in coping with the up-market side of the intercity passenger business.

There is, however, one area where the VFT concept is somewhat ahead of our institutional frameworks and that is the safety aspects of regulation.

As an interstate system, VFT transcends State Railway Acts and the envelope of the existing State railway systems' safety experience.

At 350 km/h the VFT driver would be unlikely to see an obstruction on the line ahead and stop before it; his value would lie more in seeing an obstruction on the adjoining line and radioing a warning.

At present, Australia has air and maritime safety investigation at the national level, and a measure of road vehicle safety regulation through motor vehicle certification.

'350 km/h . . . Sydney - Canberra in 1 hour'

There is nothing on the railway side because constitutionally, most railways have been State railways and left as State responsibilities.

VFT transcends this situation, and its stout vehicle structures notwithstanding, the consequences of a VFT wreck at 350 km/h would be catastrophic.

The comparison is an air crash at takeoff or landing, minus the fuel-fed fire, but plus the injury due to an absence of seat belts.

The Australian and New Zealand Railways code for coach structures weren't really framed for 350 km/h and some very skilled and realistic independent system-safety checking is going to be necessary.

Nobody has yet lost a superspeed train — in fact the unblemished Japanese Shinkansen record over 20 years, and the excellent French TGV records (blemished only by the "human wickedness" of one bomb) are statistically far safer than most conventional and moderate-speed Australian systems.

Let's ensure therefore, that our VFT keeps that record.

The VFT will have a significant impact on the environment, and this will have to be documented in detail.

After the upheaval of construction, however, VFT's net environmental impact should be wholly positive.

The system will enter the cities via existing transport corridors (which means some noise at 160-200 km/h) and its wholly-fenced, grade-separate route will have frequent crossways for humans, vehicles and in the bush, native animals.

Being electrically-powered, VFT will be non polluting and it will draw considerable traffic from the road and air, saving considerable petroleum fuel and road pollution.

It will avoid many road accidents on both the Hume and Snowy Mountains Highways.

It is hard to see the need for the contentious second Sydney Airport (SSA) once there is a VFT, and the suggestions that VFT should meander out to Sydney's far West merely to serve an SSA site are both ridiculous and expensive.

Better to put the SSA on its own interurban line, 40 minutes or so to a VFT connection in town.

So there it is. Totally different from what we've known, dearer than Parliament House, faster than the French, Super-Snowy Scheme in its impact.

VFT will provide a tremendous fillip to our economy, mobility, lifestyle, technology, and national pride.

It will put Australia on the export map for North America, the world's richest superspeed mobility market, in the next century.

It will be useful to our children and grandchildren until at least the middle of the 21st century.

So step aside, all doubters, carpers and ocker-knockers, the biggest thing on Australian rails since 1854 is on its way.

Stand well back from the fence, please folks. Here comes the VFT!

New bogie to boost exports

Australia's most successful producer of rail passenger cars is introducing a new bogie designed to enhance its product's comfort, serviceability and sales within Australia and overseas.

Comeng is incorporating into the bogies of railcars for Westrail a type of air cushion commonly found beneath delicate instrument panels and beneath manufacturing equipment for shock and vibration isolation.

The organisation — which has built almost 600 of its best-selling double deck cars — used the new bogie on $6 million worth of railcars . . . the new Westrail "Australind" which enters service soon.

The five cars involved will have a trailing arm primary suspension to soak up heavy track shocks on the two-hour Perth-Bunbury route.

The major job of passenger comfort will be attended to by the rubber air cushions, called Air Springs, which are inflated by compressed air to support the cars' 30-tonne bodies.

The Air Springs are used to absorb all relative movement between the car body and bogies, thus eliminating many of the structures found on older bogie designs. This results in reduced cost, maintenance time, and weight.

The Firestone Air bags, distributed by Air Springs Supply Pty Ltd, are the same type used beneath New South Wales' XPT express trains and luxury long-distance buses.

Their shock and vibration isolation qualities have also been used beneath medical operating tables.

Comeng introduced the Air Springs on Westrail's railcars after extensive test programmes involving dynamic computer simulation using real track condition information. This was followed by in-service testing.

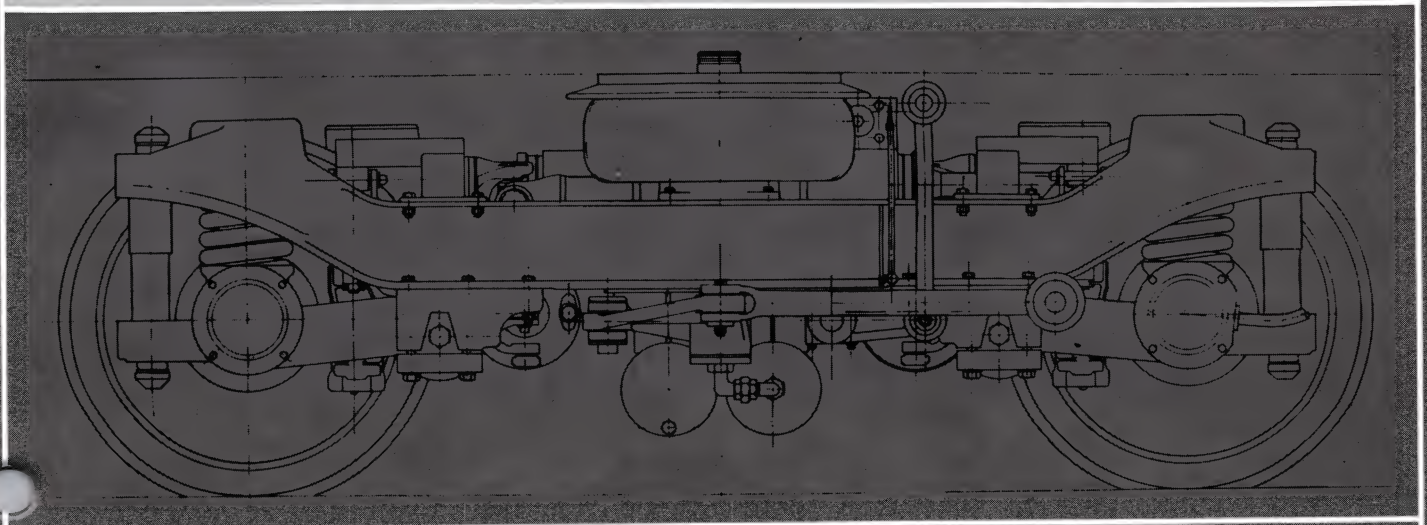
The company says the air springs — of which four 700mm diameter examples are used on each railcar — were chosen because of such advantages as:

- A high quality ride, proven in applications internationally;
- Lighter weight, through design simplicity;
- And increased durability. Similar springs are used as original equipment on heavy trucks, aircraft and industrial equipment.

The bogies into which the Air Springs are incorporated were entirely designed and developed in Australia, with stress and fatigue tests being undertaken in-house and manufacture taking place in Mittagong.

Comeng is already an exporter of rolling stock to Asia, and believes its new design is also suitable for the US market.

Westrail's new Australind.



The new bogie with doughnut-shaped Air Spring mounted top centre.

Clyde celebrates 2 Million Horsepower!

'N' Class Diesel Electric Locomotive
25 built for State Transport Authority
- Victoria : 1985-87

When locomotive N470 rolled out the door of Clyde's Melbourne factory in February 1987, it represented a landmark. Since 1951, when the first Diesel-Electric entered service in Australia Clyde has supplied diesel electric locomotives with horsepower totalling 2 million.
And there is a lot more to come.
Over the next 3 years Clyde will spend millions of dollars on computer integrated manufacturing systems and computer aided design facilities, adding to a substantial CAD investment already in place and working to put Australia into hi-tech motive power.

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'New gear' cuts a fine figure for State Rail.

The words of the old song say: "You either have, or you haven't, got style." And style with a capital "S" is what the State Rail Authority's uniformed staff will have when they start wearing their new gear early next year.

The designer's drawings pictured here have been approved by the Board, and approved in principle by unions subject to endorsement by rail staff.

Brian Powell, managing director of GAPP Pty Ltd, which designed the new uniforms, said: "We feel we have given a classic fashion image that is timeless."

"Each work category has been studied closely and specifically catered for as if it were an individual area, but never far from mind was the feeling of a corporate image.

"This has been achieved by use of th State Rail logo, in colour and accessories, from the prints on shirts to the subtle embroidery on jackets.

Image comes through with highlights using SRA corporate colours in ties, belts and scarves for the finishing touches."

The uniforms were inspected by State Rail executives at a special fashion show, and they believe the new styles will lift staff morale.

State Rail officers, with the designers, sought the opinions of individual workers and liaised closely with rail unions.

Tests began last December into various blends of wool and polyester and cotton in different fabric weights and designs, to suit the workers involved in a wide variety of railway occupations.

Another passenger service

The next time you travel on State Rail's glamour train, the XPT, look inside the seat pocket for a free copy of Expressions, the newest on-train magazine in Australia.

Expressions is a general interest holiday and travel magazine providing a stimulating insight into the people and places of New South Wales.

It contains articles on State Rail services, destinations, other items of interest and a full passenger guide to the XPT.

State Rail General Manager Passenger Services, Barry Cooney, said expressions will provide the armchair rail traveller with a wide variety of interesting topics.

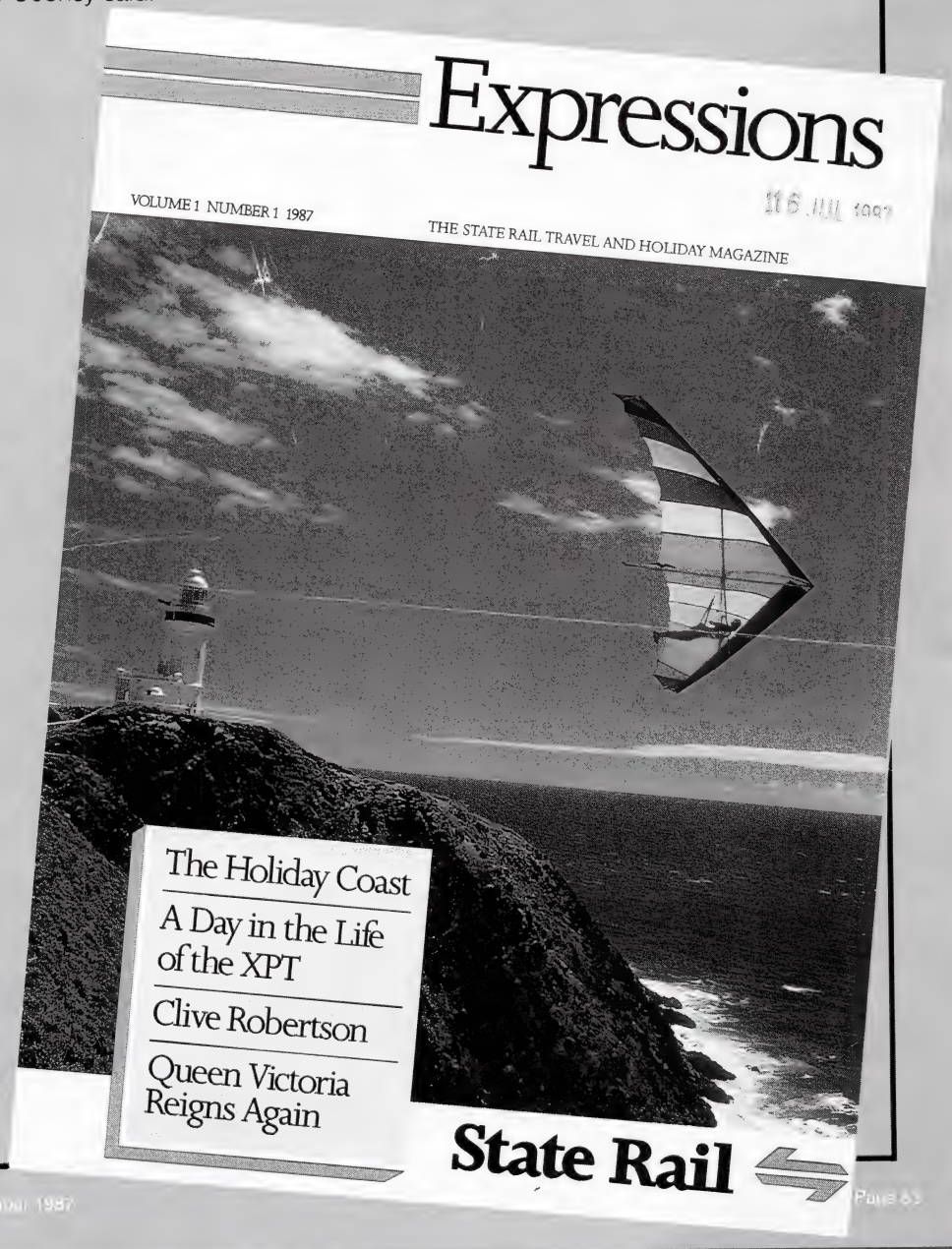
"In our first edition just released there are 24 full colour pages with articles on the magnificent Queen Victoria Building, beautiful holiday coast destinations, wine, fishing and a rare profile on the unpredictable news presenter, Clive Robertson,"

Mr Cooney said.

Mr Cooney said expressions will be a quarterly publication.

"Its name is taken from the express XPT, the fastest and most exciting train in Australia."

"We are confident Expressions will add much to the enjoyment of passengers as they relax on their journey," he added.



These flags fly at 283 locations around Australia!

They fly over our concrete plants and quarries, over asphalt plants and sand plants, at our quality control laboratories and at our administration centres.

And from these locations every working day of the year around 4500 truck loads of product is delivered to our customers for use in projects as small as a garden path or as mighty as the new Parliament House in Canberra.

To produce the right product for every job requires skill, technology and professionalism. That's what sets Readymix apart from the rest.

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A Unit of CSR Limited

Simulator solves tube training techniques

The London underground or 'tube' as more popularly known, has introduced this video disc-based simulator that will enable its drivers to experience and cope with more situations in a few hours than they are likely to meet in several months driving beneath the capital's streets.

Operating on a laser-vision system controlled by a BBC master computer, the simulator will enable a trainee driver to start, drive and stop a train in normal and emergency situations and to test reactions to a wide variety of line and signal conditions.

Developed by the National Computing Centre in north-west Britain, the simulator is believed to be the first using video disc.

Although simulators have been used for many years — especially in the aircraft industry — the underground version has been designed as a low-cost system that replaces conventional methods of teaching whilst also being cost effective.

The London underground has 680 miles (1,094km) of track, 273 stations, 457 trains and carries about 2,400,000 passengers daily.

A unique way to move your audience. Australian National's new Conference Car.

Introducing Australian National's new conference centre on wheels.

The Conference Car, a world first from Australian National, is a concept that's guaranteed to get any meeting up and rolling.

It is a fully-equipped mobile conference centre, and is literally a moveable feast.

Australian National's Conference Car can go practically anywhere there's a railway track.

Imagine a conference on the legendary Ghan, travelling to Alice Springs, the red centre.

Or even holding a conference between Adelaide and Sydney, on the Indian Pacific.

The Conference Car's Boardroom

Three meeting areas

The Conference Car has three separate sections, with access to each specially sound-proofed area.

For instance, if you demand full audio/visual facilities, the Lecture Room will hold up to 24 delegates and has all you need to ensure presentations run as smoothly as the train's journey.

(The Lecture Room also doubles as an excellent theatrette for evening entertainment.)

Should you wish to organise more of a 'round table' discussion, the Boardroom is ideal for a group of twelve people.

There is also a lounge area where a smaller group of 6 people can relax and socialize.

The Lecture Room

The Lounge area

First class conference facilities

On-board facilities include all the essentials.

A lectern, public address system, portable overhead projector, slide projector, and two ceiling-mounted video projectors.

Also two multi-system video cassette recorders, a video monitor, audio cassette player, and a photocopier.

And to keep the ideas flowing, a refrigerated bar, and tea and coffee making facilities.

Accommodation

You can choose first class roomettes and twinettes with ensuite facilities.

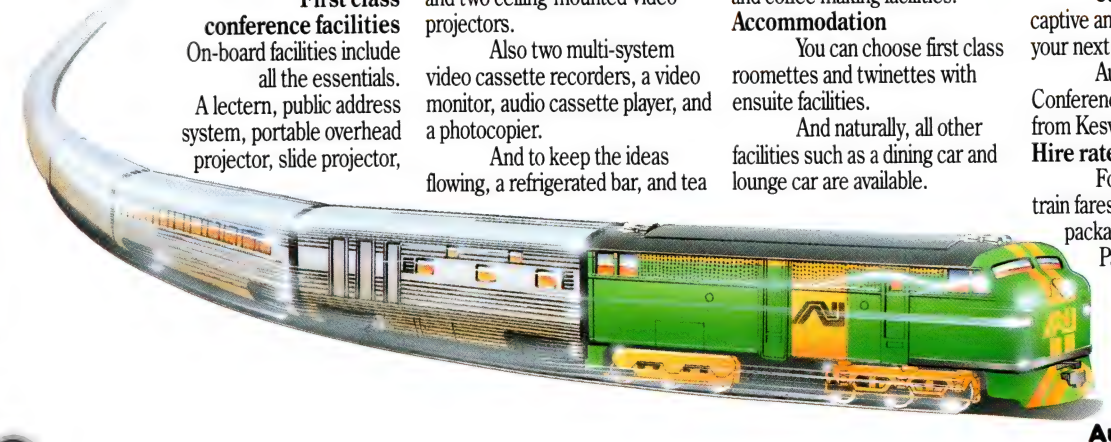
And naturally, all other facilities such as a dining car and lounge car are available.

Can you imagine a more captive and captivated audience for your next conference?

Australian National's Conference Car is now boarding from Keswick Terminal.

Hire rates

For details of hire rates, train fares and all-inclusive packages, contact John Morley, Passenger Services Marketing Manager on 217 4111.



Australian National

Getting there is half the fun.

Ogilvy ANT-0387/R

Toyotas on the rails

An Australian company has developed a revolutionary drive system which adapts Toyota vehicles for use on railways.

Western Australian company Aries-Hyrail has developed the system which is already generating valuable export orders.

The system adapts road going Toyota commercial vehicles for use on and off railway lines of any gauge.

Aries-Hyrail has been developing and manufacturing road-rail conversions for Toyotas since 1969.

The company's new system utilises the latest friction drive technology to allow drive to be taken from the vehicle's normal road wheels which has not been previously possible on narrow gauge railway.

Managing Director of Aries-Hyrail, Mr David Hinwood said the new system allows the vehicle to be driven in the normal direction of travel and adapted to any railway gauge.

"In the past friction drive systems required the vehicles to be driven in reverse to achieve forward motion," Mr Hinwood said.

Rob Schwarzer.

State Rail appoints two new deputies

Mr Rob Schwarzer and Mr Kevin Gill are the new deputy chief executives of the State Rail Authority of NSW.

Their appointments were announced late in July by chief executive Pat Johnson, after approval by the NSW Government.

"I am delighted to welcome two deputies with the knowledge and experience of Rob and Kevin," Mr Johnson said.

"Rob Schwarzer, a former chief civil engineer with SRA, brings the expertise of his engineering knowledge, while Kevin's lifelong career with the railways and its operations will provide hands-on experience at every level.

"I look forward to working with my new deputies as a team to head SRA's emergence as one of the world's top rail services.

"It is a time of radical change in many areas. Rollingstock, freighting systems and indeed our entire workforce will be visibly changed as State Rail looks toward a new era.

"It is my hope to see the people of NSW given a standard of transport and service of which we can all be proud.

"Our new deputies will play a minor role in achieving that ambition."

Kevin Gill began his railway career as a junior porter 42 years ago.

Since then he has served in practically every position in the Operations area, ranging from junior station assistant to chief operations manager.

He has worked all over NSW, rising through the ranks from porter to assistant stationmaster, stationmaster,

$5 million plus radio contract goes to Plessey

Communications within State Rail of NSW will be substantially upgraded following the installation of a $5 million plus Plessey dial-up radio telephone network.

Designed and manufactured by Plessey in Australia, the State Rail system includes more than 1,000 Plessey MTP8000 Series UHF vehicle and personnel transceivers, nine base station sites plus a network management centre at the State Rail Authority's Chullora depot.

All sites are interconnected by microwave radio links supplied by Plessey.

An area from Helensburgh south of the Sydney metropolitan area to Wyong on the NSW Central Coast, is covered by the dial-up radio network, with the design also catering for future extension to both Wollongong and Newcastle.

Up to 32 channels will allow immediate communication between State Rail offices and personnel in the field or between portable and vehicle radios resulting in faster reaction to emergency situations.

The contract has assisted Plessey with further Australian development and manufacture of similar radio systems which have a known export potential.

Plessey radio communication systems have a proven record with public authorities and utilities throughout Australia.

The State Electricity Commission of Victoria, for example, has just awarded Plessey its third major contract for Plessey MTR8000 Series mobile radios.

Kevin Gill.

Traffic inspector, district superintendent, and passenger trains manager before being appointed chief operations manager in 1981.
Kevin has been acting deputy chief executive since May 13, after the retirement of Laurie Fuller, and has acted in the position on several occasions.
As chief operations manager, Kevin was responsible for the development and implementation of many important initiatives.
They included the closure of Darling Harbour goods yard, introduction of State Rail road coaches in country NSW, re-organisation of the Operations Division, and the rationalisation of NSW country passenger services.
He holds positions on several State Rail and Urban Transit Authority (UTA) boards and committees.
Kevin is married, with six children.
Rob Schwarzer returns to State Rail after almost 18 months as chief general manager of the Urban Transit Authority.
He began his railway career in 1959 as a trainee civil engineer in Way and Works Branch.
After graduation, Rob served for 10 years as a civil engineer throughout NSW, including as division engineer at Narrabri, Tamworth, Grafton and Goulburn.
Rob made a 14-week overseas tour on a Churchill Fellowship investigating high speed railways, and on his return became division engineer, metropolitan.
In that position he was responsible for the maintenance of all civil engineering facilities in Sydney and surrounding areas.
In 1979 he was appointed project manager for the new, glamorous, country passenger XPT; he was responsible for its design, manufacture and commissioning.
From 1980 to 1981 he was chief development manager and in 1982 became chief civil engineer of Way and Works Branch — a position he held until transferring to the UTA in February, 1986.
Rob is a former chairman of Railways of Australia Vehicle/Track Research Committee, and former chairman of the Chief Engineers' Association of NSW; he currently serves on several SRA and UTA boards and committees.
He is married, with two young children.

Westrail wins staff award

Westrail has won a highly-prized award for staff communications.
The award, from the West Australian Chamber of Commerce, was for the best staff communications of any State government department or authority in 1986.
It was based on a variety of publications produced last year.
The judging was limited to published matter, and so excluded other Westrail initiatives such as a new staff briefing system.
Westrail narrowly beat Telecom WA in the government category of the competition, while the winners in other categories were Woodside Offshore Petroleum (which operates the NW Shelf project), CBH and Bunnings.
The award was accepted by Personnel Manager Clarry Brown and Public Affairs Manager David Leith at a ceremony organised by the Chamber of Commerce.

Year Book advertising orders should go in now

The Railways of Australia "Year Book and Personnel Directory" for 1988 is now in production, with statistical data being provided from all States.
Advertising rates remain unchanged from 1987. Space reservations can be made until 30 October, and should be directed to: The Advertising Manager, Railways of Australia Committee, Level 4, 85 Queen Street, MELBOURNE. Fax: (03) 670 8808.

QR posts record operating profit

Queensland Railways' operating profit and freight haulage in 1986/87 were records for an Australian Railway system.
An operating profit of $128.6 million was $10.8 million higher than the previous best, also by Queensland Railways in 1985/86.
Queensland Railways' carried 75.2 million tonnes of freight, 1.6 million tonnes up on the previous record, set in Queensland last financial year.
Queensland Railways' revenue soared to a record $1,028 million in 1986/87, exceeding the billion dollar milestone for the first time. Coal, mainly from Central Queensland, was the principal freight commodity.
About 61.3 million tonnes of coal were carried in 1986/87, 2.3 million tonnes up on the previous year.
Public support for the suburban rail system in Brisbane reached a new peak.
More than 43 million passengers used the Citytrain network in 1986/87, an increase of 2.75 million or 6.85% on the previous year.
Queensland Railways has now taken over from the Brisbane City Council bus services as the dominant public transport carrier in Brisbane.
Patronage on Brisbane trains had grown by more than 65% since electric services were introduced in 1979.
Further growth in passenger numbers is expected in 1987/88 following the extension of electric trains to Cleveland, a southern bayside suburb, in October, and between Eagle Junction and Airport Stations on the northside early in 1988.
These projects will complete the electrification of the metropolitan rail system at a cost of $400 million.
Queensland Railways' overall deficit in 1986/87, after meeting interest and redemption payments, was $40.4 million compared with $37 million in 1985/86 and $81 million in 1984/85.
Higher capital charges in 1986/87 accounted for the slight increase in the deficit compared with the previous year.

Powerful Experience

A Queensland joint venture for the Main Line Electrification Project

The CLYDE/ASEA-WALKERS joint venture provides Queensland Railways' Electrification Project in Central Queensland with a wealth of engineering experience. This powerful venture combines ASEA know-how and advanced technology in the field of AC electric locomotives, with the extensive experience of Clyde Engineering and Walkers Limited in the design and manufacture of rolling stock.

ASEA has more than 70 years experience in electric traction and in particular more than 15 years experience in electric traction with thyristor techniques.

Clyde Engineering Motive Power Division has been a constant supplier of locomotives and other railway rolling stock for more than 90 years. In 1948 Clyde became the first Associate of the Electro-Motive Division of General Motors Corporation to manufacture the GM diesel electric locomotive outside the domestic USA.

Since that time, Clyde has supplied over 1000 diesel electric locomotives to Australian Railways.

Walkers Limited has been involved in the design and construction of railway rolling stock since 1890. More recently they have supplied large numbers of diesel hydraulic locomotives and stainless steel EMU vehicles to Queensland Railways. A total of 280 EMU vehicles have been ordered so far, including the new inter-urban trains to run between Brisbane and Rockhampton by 1989.

CLYDE/ASEA-WALKERS is able to offer a strength of technical resource and wealth of design and manufacturing experience second to none.

CLYDE/ASEA-WALKERS

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But times have changed. No longer can we afford to expend our energies and resources as if there was no tomorrow.

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So if you think the concept of planned obsolescence has worn a bit thin, consider the advantages of Stainless. It's one material with built-in permanence.

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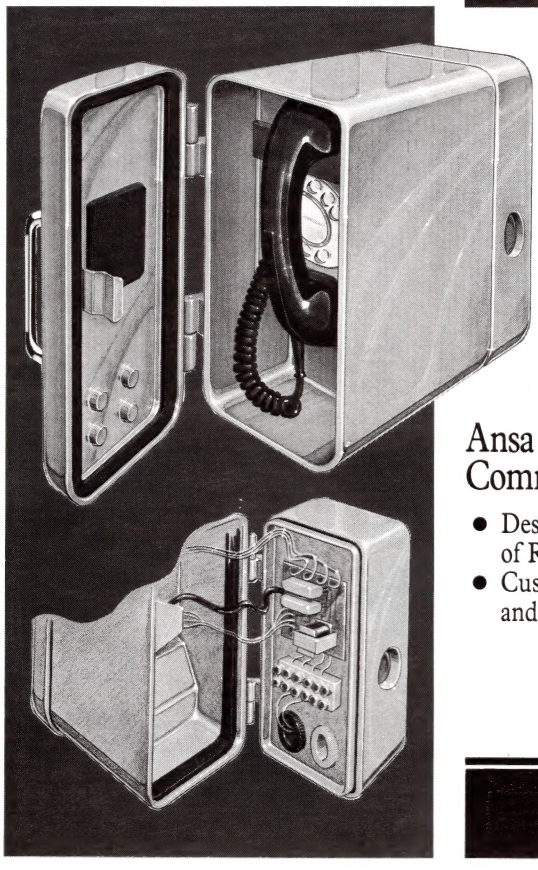
Railway, Electricity and Road Authorities throughout Australia currently use the Ansa Weatherproof Telephone extensively in their networks.

The Ansa Weatherproof Telephone is your guarantee of reliable, high quality communications under the most trying environmental conditions.



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The technology you need from OKI.
The backup you demand from Plessey.

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And in this market, OKI equipment boasts another plus – back-up from Plessey Australia Pty. Limited.

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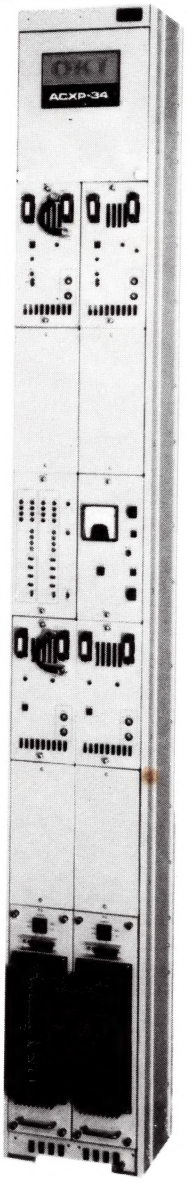
OKI offers the features you'll need to specify. Including compact solid state design, high bandwidth efficiency, minimised interference, high reliability, easy maintenance, and conformity to both CCIR and CCITT recommendations.

Within Australia, Plessey undertakes a broad range of activities from equipment design and manufacture, through systems engineering to complete turnkey communication projects for government, industry and commerce.

Our microwave turnkey services include project management, system design and engineering, technical training of personnel, the installation and commissioning of equipment and logistic support.

For more information about OKI digital microwave radio communications equipment and Plessey turnkey services, please contact the Product Manager, Microwave Systems, Telecommunications Division, Plessey Australia Pty Limited, Railway Rd, Meadowbank, N.S.W. 2114; Telephone (02) 807 0400; Telex AA 72384.

In Japan, OKI Electric Industry Company Limited, 10/3 Shibaura 4/Chome, Minato-ku, Tokyo 108 Japan. Telex: J22627.



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Over more than forty years Comeng have conceived and produced '1st-s' for Australian railway networks and is proud of its reputation as the Nation's leading rolling stock designer, manufacturer and exporter.

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